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Water Resources Technical Report for the Betze Project Environmental Impact Statement

ENSR Consulting and Engineering
Fort Collins, Colorado

and

Dr. James I. Drever
University of Wyoming
Laramie, Wyoming

Prepared for

USDI Bureau of Land Management
Elko District Office
Elko, Nevada

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Prepared for

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EXECUTIVE SUMMARY

Barrick Goldstrike Mines, Inc. proposes the expansion of an existing open-pit gold mine near Carlin, Nevada. This document is prepared as a technical report to supplement an environmental impact statement (EIS) prepared by the Bureau of Land Management, Elko District, Nevada, and contains detailed analysis of water resources impacts due to the proposed project. The report focuses on water quality impacts related to the proposed Betze Pit, waste rock disposal areas, sulfide ore stockpiles, and process facilities.

The specific findings within the report are as follows:

- Water that accumulates in the pit should not be acidic due to the existence of twice as much acid neutralizing rock as acid generating rock in the walls of the pit.

- Pit water will most likely resemble present-day groundwater. The water should meet drinking water standards with the exception of arsenic, TDS, sulfate, and manganese.

- Arsenic within pit waters will most likely occur in the pentavalent state and is not likely to be toxic (either chronic or acute) to either plants or animals.

- Should arsenic concentrations become elevated above desirable levels, treatment with ferric sulfate should be effective in removing arsenic from solution by sorption processes.

- The final Betze Pit will physically resemble a caldera with steep walls and round perimeter. The lake that will form in the pit will probably be oligotrophic with low biological productivity.

- Dilute cyanide solution utilized as process solutions are toxic and may be lethal to animals if directly ingested. However, a properly operated heap leach facility, mill facility, and tailings impoundment should not pose a hazard to humans. Accidental releases of solutions may poison aquatic species but the extent and duration of cyanide contamination are limited by the rapid degradation of cyanide in the environment.

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1.0 INTRODUCTION

Barrick Goldstrike Mines, Inc. proposes the expansion of the existing gold mining operations near Carlin, Nevada in Eureka County. The pit expansion, known as the Betze Pit, is intended to extract gold by open-pit mining methods from a sulfide ore body. At the end of mining, during which groundwater will be pumped to keep the pit dry for mining, the pit will be allowed to refill with groundwater. An additional part of the mining process will be the permanent disposal of waste rock which may contain sulfide mineralization over areas around the proposed Betze Pit. The sulfides in the waste rock may oxidize in the presence of air (oxygen) and water to produce an acidic leachate which may liberate heavy metals from the surrounding waste rock. Other related mining processes may involve the storage or permanent placement of sulfide materials or wastes from the milling of ore.

The purpose of this report is to evaluate the potential water resources impacts due to the mining of a sulfide ore body through implementation of the proposed Betze Project. The following specific items are addressed in the report:

- the quality of water that will accumulate in the Betze Pit after refilling with groundwater;
- the quality of water that will accumulate within backfill material under the alternative to fill the pit with waste rock to the pre-mining groundwater elevation;
- the potential for acidic drainage from the waste rock disposal areas;
- the quality of seepage from temporary sulfide ore stockpiles;
- the geochemistry, toxicity, bioconcentration, and sorption of arsenic in waters of the Betze Pit waterbody;
- a physical and chemical characterization of the Betze Pit waterbody; and
- the chemistry, toxicity, and degradation of cyanide within the environment.

The report is divided into nine chapters including this introduction. Chapter 2.0 provides a general discussion of how acid mine drainage (AMD) forms and how it may be controlled. Chapter 3.0 gives background information on the mine site and the geologic setting as well as a description of the development of an estimate of pit inflow water quality. Chapter 4.0 describes analysis procedures and results of laboratory tests performed on

rock samples from drill coreholes removed from the proposed Betze Pit. Chapter 5.0 describes the computation of water chemistry estimates and discusses the results of these computations. Chapter 6.0 presents a discussion of the various forms of arsenic, its toxicity, bioconcentration, and sorption in the final pit water. Chapter 7.0 presents the results of a characterization of lake productivity based upon physical and chemical parameters, and Chapter 8.0 contains a discussion of cyanide toxicity and degradation in the environment. Chapter 9.0 presents the conclusions of the report with a summary of the potential environmental impacts of the Betze Pit, waste rock disposal areas, sulfide ore stockpiles, and other related mining facilities.

2.0 REVIEW OF ACID MINE DRAINAGE

Mining of the proposed Betze Pit Expansion will extract sulfide rock from its present location at depths of up to 1,200 feet below ground surface. When rock containing sulfides is removed from below ground the sulfur may oxidize in the presence of water and air (oxygen) to form acidic water which may liberate heavy metals from surrounding rock. Therefore, a literature review of acid mine drainage (AMD) was conducted to determine the conditions necessary for generating AMD and the techniques available to mitigate any detrimental effects to the environment.

2.1 Source of Acid Mine Drainage

The majority of past work on the problem of AMD has been performed in areas of surface coal mining in the eastern United States and areas of intense hard-rock mining. The primary source of acid is the mineral pyrite (FeS_2) which oxidizes into the ferrous (Fe_2^+) ion, sulfate (SO_4) and the hydrogen (H^+) ion in the presence of water and oxygen (Caruccio and Geidel, 1978). The ferrous (Fe_2^+) ion further oxidizes to the ferric (Fe_3^+) ion producing additional acid, and pyrite can oxidize directly to the ferric (Fe_3^+) ion yielding additional sulfate and acid. Bacteria can significantly accelerate the oxidation reactions if the environment is conducive to the growth of certain bacteria, for instance thiobacillus thiooxidan which oxidizes sulfur. When the pH of an aqueous environment is in the range of 2.8 to 3.2 bacteria can live and increase the rate of pyrite oxidation (Caruccio and Geidel 1978). Once the pH of pore fluid is lowered by oxidation of pyrite the potential for leaching of other chemical species (most notably heavy metals) is enhanced (Smith 1989). Thus, the result of oxidation of pyrite is the production of acid drainage and increased mobility of heavy metals.

The rate of AMD production is dependent on a number of factors related to the existing water chemistry and the reactivity of the pyrite source (Caruccio and Geidel 1978). Sulfur can occur in several forms in the natural environment. Organic sulfur is generally not reactive and, therefore, is not of importance in evaluating the potential for AMD. Sulfur occurring as sulfate is an oxidation product and provides an indication of the rate or occurrence of pyrite oxidation. Pyritic sulfur is the sulfide phase of sulfur and is generally the most reactive. However, within the various forms of pyrite, framboidal pyrite (characterized by a globular morphology under microscopic inspection) is significantly more reactive than the other forms (Caruccio and Geidel 1978).

As the pH of pore fluid decreases the rate of oxidation and the production of AMD increases in a positive feedback loop. Conversely, as the alkalinity, or the calcium carbonate content, of

leachate increases the acid produced by pyrite oxidation can be neutralized (Caruccio and Geidel 1978). Experiments by Geidel et al. (1983) led to the conclusion that the permeability and/or the nature of physical decomposition of rock controls, to a large extent, the amount of acid generation.

2.2 Control of Acid Mine Drainage

Reduction of AMD can be achieved by either reducing the rate of acid production at the source or treating mine effluent through chemical neutralization of acid and/or removal of undesireable heavy metals (Caruccio and Geidel, 1985). The former approach may be more difficult but it reduces the leaching of heavy metals and, thus, reduces the need for any potential treatment of AMD.

A generally accepted method for curtailing acid production at the source is complete inundation of the acid-producing materials (Kleinman, 1989). Inundation places acid-generating material in an oxygen-poor environment which restricts the production of acid by oxidation of pyritic material. The technique is generally successful as long as complete inundation is maintained.

A number of low-cost methods have been developed to reduce acid production by limiting the activity of acid-producing bacteria (Kleinman 1989; Kleinman et al. 1981; Caruccio and Geidel 1985). Anionic surfactants, detergents or other bactericidal additives can be spread on the surface between regraded spoil and the topsoil layer. Infiltrating waters dissolve the additives and percolate through the potentially acid-producing material. The additives inhibit the growth of thiobacilus thiooxidans and other bacteria that accelerate the oxidation of pyrite thus reducing the overall production of acid drainage. Others additives such as phosphate complexes free the iron radical and inhibit the hydrolysis reaction which also reduces the production of acids. Direct application of lime to surfaces that may produce acid runoff will neutralize any acid produced by contact of precipitation with the surface.

Another method of reducing acid formation at the source is to hydrologically isolate acid-producing materials. Clay caps and plastic liners utilized in conjunction with topographic isolation have been used successfully to reduce the flow of runoff through acid-producing materials (Caruccio and Geidel 1985). Application of limestone to reclaimed surfaces or construction of artificial limestone recharge zones have shown some promise for reduction of acid production at the source (Caruccio and Geidel 1984; 1985; Geidel and Caruccio 1982; Burt and Caruccio 1986). Water which passes through and around limestone increases in alkalinity and thus has an increased ability to neutralize acid. However, below a threshold value of alkalinity solutions of dissolved limestone were found to accelerate the rate of pyrite oxidation. Above this threshold value the precipitation of hydrous iron oxides coats the surface of the pyrite and retards the rate of oxidation (Burt and

Caruccio 1986). Thus, the application of limestone to reclaimed surfaces is only successful where flow volumes are sufficient to maintain a high rate of alkalinity release from the limestone.

2.3 Treatment of Acid Mine Drainage

Once acid drainage has formed it may be treated by one of several techniques to reduce acidity and to precipitate out heavy metals as sludge. The simplest and most common treatment is the addition of lime or sodium hydroxide to mine effluent (Caruccio and Geidel 1985). Where flows and acid loads are larger, full-scale treatment facilities are utilized to neutralize acidity and generate a dense settleable sludge (Caruccio and Geidel 1985). An alternative to the above treatment techniques for mild to moderate acid drainage conditions is the construction of an artificial wetland to receive mine drainage. A low-lying area is covered with a limestone base followed by a layer of composted organics planted with cattails and continuously covered by at least six inches of water (Kleinman 1989). The resulting near-natural system is capable of reducing sulfate to bisulfide or pyrite with attendant reduction in acidity and the removal of iron (Caruccio and Geidel 1985).

Smith (1989) proposes a three stage approach for quantifying the potential for AMD. First, determine the total sulfur content and acid neutralization potential (ANP). The total sulfur content provides an estimate of the potential for acid production. An estimate of acid neutralization potential is based on the carbonate content of the sample. The difference between the two potentials provides an estimate of the acid generation potential of the rock sample. Second, the total sulfur content may overestimate the amount of sulfur that is available for generation of acid (Shay, 1984), therefore, it is necessary to determine the percentages of the forms of sulfur within the rocks to be exposed during mining. Important paramenters to determine are the content of sulfate, pyritic and organic forms of sulfur. Third, perform humidity cell, column lysimeter or similar leach tests to determine leachable chemical species. Tests may also be performed to evaluate the potential for acid production due to biological activity (Bruynesteyn and Hackl 1982). The results of this three stage analysis approach provide a ability to predict water quality impacts of a proposed mining project and provide input to mine operations such as location of waste rock piles, surface water control systems and reclamation (Smith 1989).

3.0 GEOLOGIC SETTING AND PIT INFLOW CHEMISTRY

The proposed Betze Project would be located about 25 miles north of Carlin, Nevada. The Betze Pit will be an expansion of the existing Post Pit which is currently being mined for gold by Barrick Goldstrike Mines, Inc. Extraction of sulfide ore will require dewatering of the pit to a depth of about 1,150 feet below the pre-mining groundwater elevation of approximately 5,300 feet. At the end of mining in the year 2,000, dewatering operations will cease and groundwater will refill the pit over the next approximately 100 to 200 years. The interaction of groundwater and the pit wall will influence the chemistry of the water in the pit, referred to as Betze Lake.

3.1 Groundwater Geology and Hydrology

Groundwater in the Betze Pit project area flows west from the Tuscarora Mountains, which are located east of the project area, to the southwest generally following the surface topography of Rodeo Creek and Boulder Creek drainage basins (Figure 3-1). The three main aquifers in the area are the Tertiary Carlin Formation, Paleozoic metasediments, and a Cretaceous granodiorite stock. Minor amounts of groundwater also occur within the recent alluvium adjacent to Rodeo, Bell, Brush, and Boulder Creeks.

The Carlin Formation underlies the relatively flat area east of Rodeo Creek. The formation dips gently to the west and consists of about 600 feet of sandy tuffaceous silts, shales, and conglomerates (BLM 1988c) that generally restricts vertical flow of groundwater. The majority of the formation is made up of the fine grained, low-permeability silts and shales, but local zones of coarse-grained material yield water. The Paleozoic metasediments underlie the Tuscarora Mountains and the topographic high in which the Betze Pit is located (Figure 3-1). The metasediments have been extensively fractured and altered producing a secondary porosity and permeability that varies throughout the formations. A low-permeability granodiorite stock is intruded into the metasediments near the southeast end of the proposed pit resulting in the northward deviation of the 5,400-foot groundwater contour (Figure 3-1).

The source of groundwater in the Betze Pit area was from the east and northeast under pre-mining conditions. However, since the commencement of dewatering of the Post Pit a localized cone of depression has been forming in the groundwater surface around the pit. Predictions of groundwater impacts due to dewatering of the Betze Pit were developed by Leggette, Brashears, and Graham, Inc. (1990) utilizing the U.S. Geological Survey computer model known as MODFLOW. A localized cone of depression will form around the Betze Pit down to the elevation of the bottom of the pit which will be reached in the year 2000. As the pit refills, the cone of

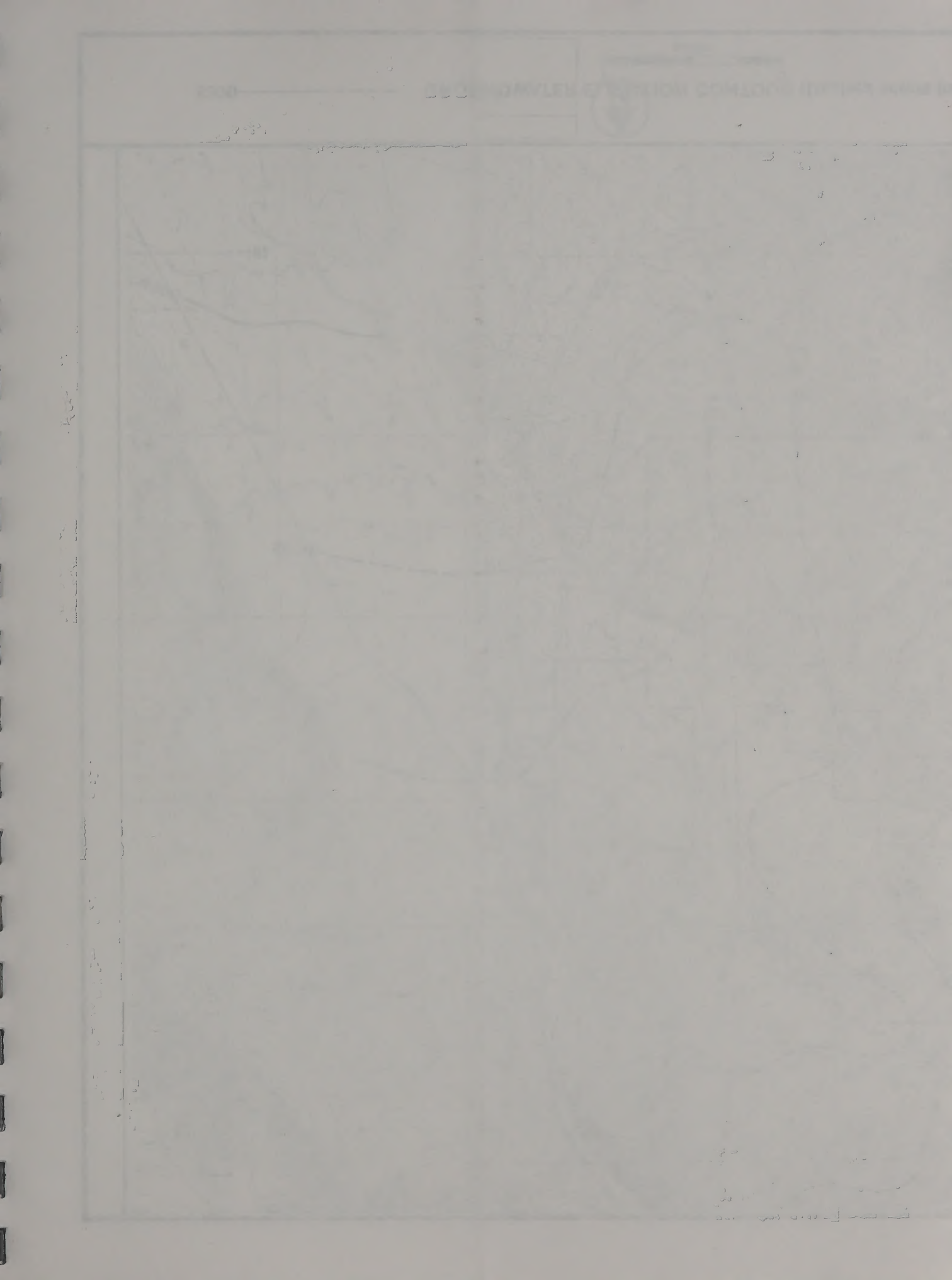
5300 GROUNDWATER ELEVATION CONTOUR (Dashed where inferred.)

0 1 miles

N

BETZE PROJECT

Figure 3-1. Pre-Dewatering Groundwater Elevation Map



depression will rise and expand outward maintaining radial flow towards the pit from all directions. The level of water in the pit will be within about 45 feet of pre-mining water levels by the year 2100. At a future point, the level will rise to the pre-mining levels and groundwater will flow into and out of the waterbody in the Betze Pit. Estimates of groundwater throughflow rates under equilibrium conditions are presented in Table 3-1.

3.2 Chemical Composition of Pit Inflow

Existing water quality data from sampling of groundwater wells was utilized to estimate the chemical composition of groundwater flowing into the pit. A database of water quality data for wells within and surrounding the proposed pit (see Appendix D) indicates that groundwater within the Betze Pit is relatively consistent in composition to groundwater outside the pit, with the exception of arsenic. High levels of arsenic (on the order of 0.8 mg/l) occur in wells drawing water from within the ore body (i.e., Well BW-1, Table 3-2) and moderate levels of arsenic (0.02 to 0.05 mg/l) occur in wells surrounding the ore body and within the Carlin Formation (Table 3-2). According to Barrick geologists (M. Smith 1990), high levels of arsenic are correlated with high concentrations of gold within rock samples. Arsenic-containing rock will be removed during the mining process and will be placed above the groundwater in waste rock disposal areas or process areas. Furthermore, the dewatering process will remove the groundwater that was in contact with the arsenic-containing rock. Therefore, water subsequently flowing into the pit will not come into contact with these high-arsenic rocks and should contain less arsenic than water currently being pumped by dewatering wells.

An estimate of pit inflow chemical composition was computed by averaging the observed chemical composition of water from six wells located outside the proposed Betze Pit. Table 3-3 presents geologic information about each of the wells and Figure 3-1 shows the location of each well. The six wells were selected such that the wells were located outside the area to be mined; that the wells are roughly equally spaced around the pit; and that the wells represented water from the formations expected to contribute groundwater to the Betze Pit during filling. Spacing of the selected wells is roughly equal, but there are no wells located to the northwest of the proposed pit. Nevertheless, the six wells represent a reasonable approximation of groundwater that is expected to fill the Betze Pit (Table 3-4).

The following wells were selected for the reasons presented below:

TABLE 3-1

PIT INFLOW, OUTFLOW, AND

CONCENTRATION FACTOR FROM EVAPORATION

Year	Storage Accretion[1] (cfs)	Groundwater Inflow[1] (cfs)	Groundwater Outflow[1] (cfs)	Evaporation[1] (cfs)	Concentration[2] Factor
0					
1	15.6	19.3	2.7	0.98	1.06
3.5	11.8	13.3	0.5	0.98	1.07
10	12.8	14.9	1.1	0.98	1.07
30	5.7	7.2	0.5	0.98	1.12
100	0.4	2.0	0.6	0.98	1.35
200	0.0	1.8	0.8	0.98	1.61
Infinite	0.0	1.8	0.8	0.98	2.25

[1] Data from Legette, Brashears & Graham, Inc. 1990.

[2] Multiple for concentration of a conservative tracer over inflow concentration.

TABLE 3-2

MEAN WATER QUALITY DATA FOR GROUNDWATER WELLS

PARAMETER	CARLIN		GRANODIORITE		METASEDIMENTS		
	GWOP-6	GWOP-11	WW-1	GWOP-4	BAZZA WELL	BW-1	P-181
Alkalinity as CaCO3, mg/l	151.333	176.000	143.600	199.167	421.909	414.000	153.250
Aluminum (T) as Al, mg/l	9.800	3.820	<0.100	10.647	0.089	<0.100	<0.100
Ammonia as NH3-N, mg/l	1.470	<0.200	0.166	0.213	1.688	1.160	0.173
Arsenic (T) as As, mg/l	0.048	0.026	0.032	0.798	0.028	0.796	0.024
Barium (T) as Ba, mg/l	0.580	0.286	0.041	0.466	0.198	0.146	0.079
Bicarbonate as HCO3, mg/l	185.667	180.600	174.400	242.667	512.636	504.000	186.750
Boron (T) as B, mg/l	0.214	0.254	0.158	0.165	0.738	0.840	0.134
Cadmium (T) as Cd, mg/l	<0.010		<0.010	<0.010	<0.010		<0.010
Calcium as Ca, mg/l	33.967	33.600	58.400	52.083	95.009	90.600	41.438
Carbonate as CO3, mg/l	1.667	14.700	0.500	3.333	1.364	<5.000	0.000
Chloride as Cl, mg/l	58.433	32.200	59.760	24.400	15.982	14.600	31.425
Chromium (Hex) as Cr, mg/l	<0.010		<0.010	0.014	<0.010		<0.010
Chromium (T) as Cr, mg/l	0.032	0.004	<0.010	0.018	0.004	<0.010	0.021
Conductivity, uhmos/cm	818.167	561.818	767.857	504.867	945.091	1748.000	495.875
Copper (T) as Cu, mg/l	0.186	0.010	<0.020	0.092	0.032	0.005	0.014
Cyanide (T) as CN, mg/l	0.904	<0.005	0.035	0.007	<0.010	<0.005	0.003
Cyanide (Free) as CN, mg/l	0.546	<0.100	<0.002	0.050	0.026	<0.100	<0.002
Cyanide (WAD) as CN, mg/l	1.038	<0.005	0.007	<0.010	<0.005	<0.005	
Fluoride as F, mg/l	1.187	1.180	0.344	0.620	1.448	1.540	0.622
Gold as Au, mg/l	0.011	0.003	0.010	0.009	<0.050	0.005	0.008
Hardness as CaCO3, mg/l	186.667	134.200	295.200	209.333	337.364	336.000	212.750
Hardness (Non-Carb) as CaCO3, mg/l	34.000		129.250	0.000	15.800		26.250
Hardness (T) as CaCO3, mg/l	169.500		304.750	151.500	339.200		186.000
Hydroxide as OH, mg/l	1.667	<5.000	<5.000	<5.000	1.364	<5.000	0.000
Iron (D) as Fe, mg/l	0.205		0.227	0.174	0.193		0.043
Iron (T) as Fe, mg/l	6.680	3.436	0.828	11.950	1.669	1.582	0.572
Lead (T) as Pb, mg/l	0.056	0.011	0.010	0.041	0.019	<0.005	0.035
Magnesium as Mg, mg/l	17.700	10.420	37.140	15.267	24.500	22.200	20.075
Manganese (T) as Mn, mg/l	1.101	0.092	0.015	0.583	0.060	0.035	0.008
Mercury as Hg, mg/l	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nickel (T) as Ni, mg/l	0.051	0.006	0.030	0.021	0.009	0.010	0.016
Nitrate as NO3-N, mg/l	3.917	0.595	1.018	0.704	0.044	0.050	0.451
Nitrite as NO2-N, mg/l	0.579		0.055	0.006	0.006		0.017
Phosphate (Ortho) as PO4-P, mg/l	0.136	0.122	0.021	0.120	0.051	0.104	0.240
Potassium as K, mg/l	5.867	14.400	7.540	7.883	20.555	23.000	2.688
Selenium (T) as Se, mg/l	<0.005	<0.005	0.003	<0.002	0.002	0.005	0.001
Silica (D) as SiO2, mg/l	46.150		25.625	42.100	33.560		29.663
Silica (T-ICP) as SiO2, mg/l	35.000	29.400	8.300	25.250	21.000	18.200	
Silver (T) as Ag, mg/l	<0.010	<0.005	<0.010	<0.010	<0.010	<0.005	0.022
Sodium as Na, mg/l	87.533	72.400	35.980	42.167	72.155	75.400	27.950
Sulfate as SO4, mg/l	111.267	73.600	152.000	44.900	101.764	88.200	58.188
Settleable Solids, mLs/L/hr	0.200	0.840	<0.100	1.150	<0.100	<0.100	
Suspended Solids, mg/l	1050.333	417.400	3.760	1666.833	10.136	47.800	1.688
Thallium as Tl, mg/l	<0.010	<0.005	<0.001	<0.010	<0.010	<0.005	<0.010
Total Dissolved Solids, mg/l	500.333	362.000	536.400	359.333	583.364	692.000	364.875
Turbidity, NTU	260.000	62.284	4.128	172.800	15.182	3.300	2.071
Zinc (T) as Zn, mg/l	0.460	0.017	0.101	0.188	0.065	0.010	0.143
pH Units	7.557	8.191	7.874	7.559	7.245	7.000	7.721
Cations, meq/l	6.725		7.843	4.840	10.118		5.019
Anions, meq/l	6.645		7.605	5.110	10.318		5.201

TABLE 3-3

GROUNDWATER WELLS UTILIZED TO ESTIMATE COMPOSITION OF PIT INFLOW

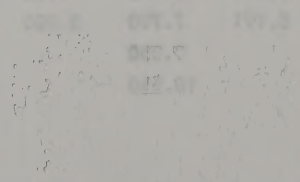
Well ID	# of Samples	Total Depth (feet)	Screened Intervals (feet)	Formation/Rock Type
AA Well	17	803	160-700	Carlin/Paleozoic limestone and siltstones
GWOP-11	11	80-100	2-100	Carlin
WW-1	7	300		Granodiorite
Bazza Well	10	613	163-613	Paleozoic limestones and siltstones
NPPW-3	4	1,213	538-1,038 1,087-1,207	Carlin/Paleozoic limestones and siltstones
West Bazza Pit	1			Paleozoic limestones and siltstones

[1]Elevation based on an approximate ground level elevation.

Table 3-4

Estimated Composition of Groundwater Inflow to Betze Pit

PARAMETER	AA WELL	BAZZA WELL	WW-1	GWOP-11	WEST BAZZA PIT	NPPW-3	PIT INFLOW
Alkalinity as CaCO3, mg/l	153.462	421.909	143.600	176.000	409.000		260.794
Aluminum (T) as Al, mg/l	0.289	0.089	0.064	3.820	0.160		0.884
Ammonia as NH3-N, mg/l	0.332	1.688	0.166	0.100	0.650		0.587
Arsenic (T) as As, mg/l	0.065	0.028	0.032	0.026	0.013	0.005	0.028
Barium (T) as Ba, mg/l	0.049	0.198	0.041	0.286	0.092	0.200	0.144
Bicarbonate as HCO3, mg/l	186.846	512.636	174.400	180.600	499.000		310.697
Boron (T) as B, mg/l	0.125	0.738	0.158	0.254	0.840		0.423
Cadmium (T) as Cd, mg/l	0.006	0.005	0.005		0.005	0.005	0.005
Calcium as Ca, mg/l	28.192	95.009	58.400	33.600	50.800		53.200
Carbonate as CO3, mg/l	0.769	1.364	0.500	14.700	0.000		3.467
Chloride as Cl, mg/l	17.677	15.982	59.760	32.200	20.000		29.124
Chromium (Hex) as Cr, mg/l	0.005	0.005	0.005		0.005		0.005
Chromium (T) as Cr, mg/l	0.004	0.004	0.005	0.004	0.005	0.010	0.005
Conductivity, uhmos/cm	451.231	945.091	767.857	561.818	904.000	538.000	694.666
Copper (T) as Cu, mg/l	0.017	0.032	0.008	0.010	0.005	0.010	0.013
Cyanide (T) as CN, mg/l	0.001	0.002	0.035	0.003	0.001		0.009
Cyanide (Free) as CN, mg/l	0.016	0.026	0.009	0.050	0.001		0.020
Cyanide (WAD) as CN, mg/l	0.003	0.003	0.007	0.003		0.003	0.003
Fluoride as F, mg/l	0.477	1.448	0.344	1.180	1.350		0.960
Gold as Au, mg/l	0.005	0.006	0.010	0.003	0.005		0.006
Hardness as CaCO3, mg/l	155.538	337.364	295.200	134.200	286.000		241.660
Hardness (Non-Carb) as CaCO	0.000	15.800	129.250		0.000		36.263
Hardness (T) as CaCO3, mg/l	130.000	339.200	304.750		277.000		262.738
Hydroxide as OH, mg/l	0.769	1.364	0.500	2.500	0.000		1.027
Iron (D) as Fe, mg/l	0.073	0.193	0.227		0.005		0.125
Iron (T) as Fe, mg/l	0.657	1.669	0.828	3.436	0.075		1.333
Lead (T) as Pb, mg/l	0.009	0.019	0.010	0.011	0.015	0.025	0.015
Magnesium as Mg, mg/l	16.192	24.500	37.140	10.420	36.200		24.890
Manganese (T) as Mn, mg/l	0.055	0.060	0.014	0.092	0.015		0.047
Mercury as Hg, mg/l	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nickel (T) as Ni, mg/l	0.008	0.009	0.030	0.006	0.020		0.015
Nitrate as NO3-N, mg/l	0.479	0.044	1.018	0.595	0.700	0.525	0.560
Nitrite as NO2-N, mg/l	0.015	0.006	0.055		0.039		0.029
Phosphate (Ortho) as PO4-P,	0.108	0.051	0.021	0.122	0.005		0.061
Potassium as K, mg/l	6.346	20.555	7.540	14.400	31.200		16.008
Selenium (T) as Se, mg/l	0.002	0.002	0.003	0.003	0.003		0.003
Silica (D) as SiO2, mg/l	44.133	33.560	25.625		24.800		32.030
Silica (T-ICP) as SiO2, mg/	28.250	21.000	8.300	29.400			21.738
Silver (T) as Ag, mg/l	0.007	0.004	0.005	0.003	0.005		0.005
Sodium as Na, mg/l	28.938	72.155	35.980	72.400	82.200		58.335
Sulfate as SO4, mg/l	49.508	101.764	152.000	73.600	82.800		91.934
Settleable Solids , mLs/L/h	0.088	0.050	0.050	0.840			0.257
Suspended Solids, mg/l	12.938	10.136	3.760	417.400	0.500		88.947
Thallium as Tl, mg/l	0.004	0.004	0.005	0.003	0.005		0.004
Total Dissolved Solids, mg/	316.000	583.364	536.400	362.000	504.000		460.353
Turbidity, NTU	4.421	15.182	4.128	62.284	0.770		17.357
Zinc (T) as Zn, mg/l	0.099	0.065	0.101	0.017	0.005	0.023	0.052
pH Units	7.479	7.245	7.874	8.191	7.790	8.000	7.763
Cations, meq/l	4.220	10.118	7.843		9.950		8.033
Anions, meq/l	4.214	10.318	7.605		10.550		8.172



- West Bazza Pit: This is a pit that was mined for gold and was excavated about 80 feet below the groundwater elevation into the Paleozoic sediments which are host rocks to the gold deposits. Water level lowering in West Bazza Pit was observed during pumping of dewatering wells, indicating close hydraulic connection between the this pit and the area to be mined.

- Bazza Well: This is a water supply well within the Paleozoic sediments.

- WW-1: This is also a water supply well. It is located within the granodiorite southeast of the proposed Betze Pit.

- AA Well: A water supply well, this well is located on the east side of Rodeo Creek and withdraws water from both the Carlin Formation and the underlying Paleozoic metasediments.

- GWOP-11: This is a monitoring well located down-gradient of the existing tailings impoundment. It is approximately 100 feet in depth and draws water from the Carlin Formation only. Although the well is shallow, it represents water flowing laterally into the pit from the Carlin Formation.

- NPPW-1: This is a water supply well operated by Newmont at Mill No. 4, northeast of the proposed Betze Pit. The well draws water from both the Carlin and underlying Paleozoic formations. It is located up-gradient of the pit under pre-mining conditions.

3.3 Geology of Betze Pit Walls

The groundwater flowing into the Betze Pit following the end of mining will pass through the wallrock of the pit and may react with the sulfides and heavy metals within the rock. Therefore, a geologic map (Figure 3-2) was developed to depict the outcrops of various rock formations and ore that would remain within the pit walls. This map was compiled from cross sections and slice maps provided by Barrick Goldstrike Mines, Inc. (1990). Outcrop areas were measured by planimeter and corrected to account for pit slope. The outcrop area for each geologic formation and for ore along with the percentages of each are presented in Table 3-5.

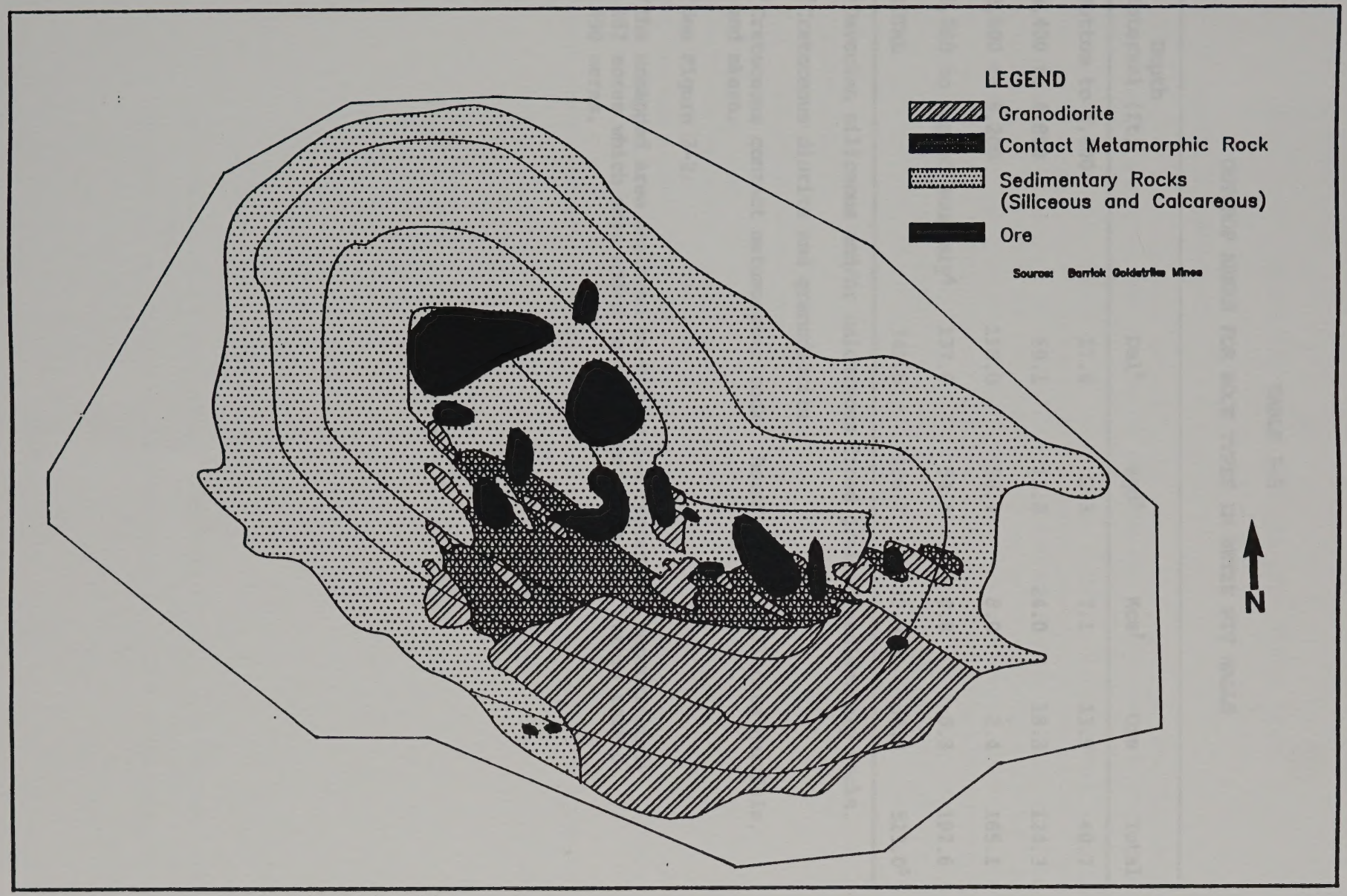


Figure 3-2. Geologic Map of Betze Pit Walls

TABLE 3-5

OUTCROP AREAS FOR ROCK TYPES IN BETZE PIT WALLS

Depth Interval (ft)	Dsl[1]	Kgd[2]	Kcs[3]	Ore	Total
Bottom to 4,400	17.4	2.3	7.1	13.9	40.7
4,400 to 4,800	69.1	12.9	24.0	18.3	124.3
4,800 to 5,200	118.0	36.7	8.0	2.4	165.1
5,200 to Mapped Boundary[4]	137.0	54.8	0.8	0.3	192.6
TOTAL	341.5	106.7	39.9	34.9	523.0[5]

[1] Devonian siliceous and/or calcareous fined grained sedimentary rocks.

[2] Cretaceous diorite and granodiorite.

[3] Cretaceous contact metamorphic rock: hornfels, calcsilicate hornfels, and skarn.

[4] See Figure 3-2.

[5] The unmapped area depicted on Figure 3-2 represents approximately 167 acres which when added to the mapped area (523 acres) totals 690 acres.

4.0 LABORATORY ANALYSIS OF ORE AND WASTE ROCK

4.1 Whole Rock Analysis

Static tests of crushed whole rock samples define the balance between acid generating and acid consuming components within the sample. The acid consuming portion of geologic material may be represented by the content of reactive sulfur within the sample which is generally the pyritic sulfur portion of the material. The acid consuming portion of a geologic material may be represented by the carbonate content of the sample or by a direct measure of the acid buffering capacity of the sample. In any case, the static test represents a worst-case evaluation of the acid generating potential of a sample, and it does not provide information on reaction rates or potential metals dissolution. Under field conditions all the sulfur, reactive sulfur, or carbonate may not be available for reaction with percolating waters. Therefore static tests are a qualitative measure of the potential for a material to generate acid.

4.1.1 Description of Analysis Procedure

Core samples were selected from exploration drill holes at Barrick Goldstrike Mine to characterize the acid generation potential of the Betze Pit wall rock, waste rock, and sulfide ore. Crushed rock samples were obtained from core intervals that averaged about 100 feet in length. Samples were sent to Core Laboratories in Aurora, Colorado for analysis.

The following chemical analyses were performed on the core samples:

- Quantitative whole rock analysis for the following constituents:

  Arsenic
  Barium
  Boron
  Cadmium
  Chromium
  Copper
  Iron
  Lead
  Magnesium
  Manganese
  Mercury
  Nickel
  Selenium
  Silver
  Thallium

- Acid Generation Potential:

  Neutralization potential in tons $CaCO_3$ per 1,000 tons sample.
  Potential acidity in tons $CaCO_3$ per 1,000 tons sample.

- Forms of Sulfur:

  Sulfate
  Pyritic
  Organic
  Total Sulfur

4.1.2 Whole Rock Analysis Results

Results of the whole rock analyses for 41 samples from the Betze Pit are presented in Table 4-1. Computation of acid generating potential is presented in Table 4-2. A net acid neutralizing potential is computed by taking the difference between the total sulfur content and acid neutralizing potential for each sample. An average of results for each rock type shows that the granodiorite is acid consuming while the sedimentary rocks are slightly acid generating. The samples with high acid generating potential are for the most part sedimentary rocks or sulfide ore. A weighted average of the sample results accounts for the greater volume of sedimentary rocks than granodiorite and shows that the samples on the whole represent a net acid neutralizing potential. Therefore, a mixture of all rock from the proposed Betze Pit would have the overall ability to consume acid.

4.2 Humidity Cell Tests

4.2.1 Description of Analysis Procedure

The following discussion is modified from a description of humidity cell testing procedures provided by Core Laboratories, Inc., Aurora, Colorado (1990). Humidity cell testing is a kinetic test which attempts to simulate the acid-producing and acid-consuming processes which occur in the natural environment. Humidity cell testing is a laboratory procedure for which analytical results are often difficult to interpret.

4.2.1.1 Sample Preparation. Samples are air-dried at room temperature for 24 hours or until a stable weight is obtained. Air-dried samples are then crushed to minus-10 mesh (2 mm), using a disk pulverizer and thoroughly blended. Air-dried, crushed samples are stored in plastic bags until analysis.

4.2.1.2 Test Apparatus. Humidity test cells are plastic containers with tight-fitting lids. Each cell is 2.75 inches high and 7 inches square. An air inlet feeds into the center of the top lid and a drain fitting is located in the bottom corner of each cell (Figure 4-1). A series of 12 individual humidity cells is connected to a regulated source of compressed air using equal lengths of 0.5 inch diameter Tygon tubing. Humidified air is generated using a 6.5 gallon glass carboy which is half-filled with deionized water. This carboy is equipped with Tygon tubing

TABLE 4-1

WHOLE ROCK ANALYSIS

Sample I.D.	TOT S%	PYR S%	SUL UNID%	SUL S%	APP/P %	TOT S*	PYR S*	APP/P*	ANP*	TOT As mg/kg	TOT Ba mg/kg	TOT B mg/kg	TOT Cd mg/kg	TOT Cr mg/kg	TOT Cu mg/kg	TOT Fe mg/kg	TOT Pb mg/kg	TOT Hg mg/kg	TOT Mg mg/kg	TOT Mn mg/kg	TOT Ni mg/kg	TOT Se mg/kg	TOT Ag mg/kg	TOT Tl mg/kg
WR-1	<0.01	0.12	—	<0.01	<0.01	<0.3	3.8	<0.1	61.3	39	227	<10	<0.5	40	40	26,100	14	<0.15	3,680	346	32	<10	<1	<20
WR-1P	<0.01	0.05	<0.01	<0.01	<0.01	<0.3	1.6	<0.1	46.4	442	169	<5	<1.0	19	26	19,800	30	0.23	4,440	545	28	<10	<1	<20
WR-2	1.45	1.23	—	0.09	1.28	45.3	38.4	40.0	<0.1	1,790	515	<10	4.8	56	66	25,600	14	10.60	427	96	127	<10	2	<20
WR-2P	1.01	0.62	0.37	0.02	0.16	31.6	19.4	5.0	3.8	845	150	<5	3.0	84	56	16,700	8	2.04	485	78	114	10	<1	<20
WR-3	<0.01	0.01	—	<0.01	<0.01	<0.3	0.3	<0.1	63.0	24	197	<10	<0.5	68	30	29,500	6	<0.15	15,500	306	36	<10	<2	<20
WR-3P	<0.01	0.02	<0.01	<0.01	<0.01	<0.3	0.6	<0.1	40.0	60	119	<5	<1.0	42	60	27,600	<5	0.18	12,000	275	26	<10	<1	<20
WR-4	1.69	1.49	—	0.08	1.39	52.8	46.6	43.4	0.2	674	1,490	<10	<0.5	34	34	23,200	26	5.47	385	65	83	<10	<2	<20
WR-4P	4.35	3.54	0.75	0.06	2.89	136.0	111.0	90.3	0.4	4,700	120	7	5.0	3	24	46,800	36	2.19	285	12	42	10	<2	30
WR-5	0.42	0.26	—	<0.01	0.23	13.1	8.1	7.2	52.3	44	430	<10	<0.5	65	9	35,800	7	<0.15	19,500	561	14	<10	<2	40
WR-5P	1.20	0.96	0.25	<0.01	0.42	37.8	30.0	18.8	171.0	1,910	255	<5	<1.0	46	14	36,500	10	<0.15	14,500	776	22	<10	<1	40
WR-6	0.72	0.65	—	0.02	0.48	22.5	20.3	15.0	221.0	158	306	<10	<0.5	22	23	16,600	<5	0.77	8,380	288	34	<10	<1	<20
WR-6P	1.40	1.32	0.06	0.02	0.69	43.8	41.2	13.1	224.0	709	140	<5	1.0	8	30	26,300	7	0.48	10,500	432	46	<10	<1	<20
WR-7	1.59	1.30	—	0.01	1.39	49.7	40.6	43.4	107.0	727	247	<10	<0.5	37	20	42,200	49	0.34	17,700	612	11	<10	<1	<20
WR-7P	1.61	1.66	<0.01	0.01	0.58	50.3	51.9	21.6	122.0	1,170	189	<5	<1.0	20	8	40,700	6	<0.15	13,900	579	8	<10	<1	<20
WR-8	1.25	0.89	—	0.11	0.67	39.1	27.8	20.9	<0.1	835	224	<10	2.7	58	69	29,800	11	18.80	478	116	250	<10	2	<20
WR-8P	2.15	1.90	0.33	0.16	<0.01	67.2	59.4	18.1	4.8	1,010	32	<5	38.0	40	192	23,900	13	16.60	524	30	216	20	4	<20
WR-9	0.02	0.01	—	0.02	<0.01	0.6	0.3	<0.1	3.2	88	197	<10	<0.5	30	110	9,440	34	2.74	357	40	10	<10	1	<20
WR-9P	0.02	0.02	<0.01	0.05	<0.01	0.6	0.6	<0.1	3.8	113	179	<5	<1.0	32	146	15,000	40	1.83	353	36	8	10	<1	<20
WR-10	0.01	<0.01	—	<0.01	<0.01	0.3	<0.3	<0.1	6.4	1,500	283	<10	13.5	29	44	19,500	9	4.74	401	41	32	<10	<2	<20
WR-10P	<0.01	0.03	<0.01	0.01	<0.01	<0.3	0.9	<0.1	13.9	1,070	400	<5	20.0	17	66	16,000	10	8.00	1,400	222	68	<10	<1	<20
WR-11	0.01	0.01	—	0.01	<0.01	0.3	0.3	<0.1	2.4	1,260	374	<10	16.0	31	44	18,400	13	4.72	387	41	35	<10	<2	<20
WR-11P	4.57	3.29	1.22	0.06	2.37	143.0	103.0	74.1	0.4	5,290	155	<10	6.0	4	32	43,300	44	2.46	315	16	48	10	2	20
WR-12	0.16	0.13	—	<0.01	0.10	5.0	4.1	3.1	163.0	10	242	<10	<0.5	76	76	32,700	<5	<0.15	19,200	461	44	<10	<2	<20
WR-12P	0.56	0.47	0.09	<0.01	0.02	17.5	14.7	0.6	191.0	273	118	<5	<1.0	72	20	33,600	6	<0.15	15,500	562	66	<10	<1	<20
WR-13	1.92	1.22	—	0.06	1.21	60.0	38.1	37.8	7.2	223	130	<10	<0.5	25	27	24,400	15	1.59	1,250	224	34	<10	<2	<20
WR-13P	0.45	0.49	<0.01	0.10	0.40	14.1	15.3	12.5	15.0	96	92	<10	<1.0	42	44	22,400	9	1.35	224	135	37	<10	<1	<20
B-1	0.17	0.06	0.07	0.04	<0.01	5.3	1.9	<0.1	1.8	596	92	<5	3.0	15	39	9,690	20	4.00	107	10	51	<10	<1	<20
B-2	0.17	0.02	<0.01	0.17	<0.01	5.3	0.6	<0.1	2.0	292	156	<5	<1.0	11	42	13,200	85	1.72	434	43	4	<10	<1	<20
B-3	0.60	0.69	<0.01	0.05	0.31	18.8	21.6	9.7	7.2	586	774	<5	3.0	12	90	23,300	16	2.91	1,600	81	96	10	<1	<20
B-4	1.50	1.37	0.07	0.06	0.88	46.9	42.8	27.5	17.5	2,000	150	—	4.7	23	96	45,600	9	1.79	4,000	1,050	240	<20	<1	<20
B-5	0.42	0.24	0.04	0.14	0.01	13.1	7.5	0.3	0.1	1,450	287	<5	<1.0	6	92	18,500	7	3.00	165	260	24	<10	<1	<20
B-6	2.21	1.99	0.02	0.20	1.03	69.1	62.2	32.3	8.0	1,950	165	<5	5.0	10	56	30,700	14	6.40	4,100	176	118	<10	<1	<20
B-7	0.09	0.06	0.03	<0.01	<0.01	2.8	1.9	<0.1	3.6	210	190	—	<0.5	10	25	6,200	5	0.80	107	490	8	<10	<1	<10
B-8	1.16	0.93	0.12	0.14	0.33	36.2	29.1	10.3	1.5	1,440	404	<5	1.0	11	29	15,600	27	1.80	286	9	73	<10	<1	<20
B-9	0.99	0.46	0.52	0.01	0.93	30.9	14.4	29.1	7.2	442	462	<5	4.0	17	33	12,000	45	1.37	437	13	79	10	<1	<20
B-10	4.52	3.70	0.72	0.10	3.16	141.0	116.0	98.8	48.3	4,790	46	<5	<1.0	29	73	47,500	11	7.40	6,790	497	77	<10	<1	<20
B-11	0.23	0.41	<0.01	<0.01	0.04	7.2	12.8	1.2	107.0	697	283	<5	<1.0	32	11	33,100	<5	<0.15	16,600	539	17	<10	<1	<20
B-12	0.30	0.49	<0.01	0.01	<0.01	9.4	15.3	<0.1	125.0	706	269	<5	<1.0	26	12	34,600	5	<0.15	17,100	541	7	<10	<1	<20
B-13	2.86	1.68	1.10	0.08	1.13	89.4	52.5	35.3	75.1	5,080	223	<5	<1.0	15	39	26,100	14	52.20	4,770	195	103	<10	<1	40
B-14	1.38	0.83	0.52	0.03	0.39	43.1	25.9	12.2	42.4	1,450	147	<5	<1.0	8	20	30,600	13	19.20	2,970	168	26	<10	<1	40
B-15	2.17	1.46	0.54	0.17	1.30	67.8	45.6	40.6	8.5	2,250	145	<5	4.0	9	62	30,600	8	8.00	3,530	160	118	<10	<1	<20

FOOTNOTES:

TOT - Total
S - Sulfur
PYR - Pyritic
SUL - Sulfate
UNID - Unidentified
APP/P - APP/Peroxide
* - Tons $CaCO_3$/1,000 tons
ANP - Acid Neutralizing Potential

As - Arsenic
Ba - Barium
B - Boron
Cd - Cadmium
Cr - Chromium
Cu - Copper
Fe - Iron
Pb - Lead

Hg - Mercury
Mg - Magnesium
Mn - Manganese
Ni - Nickel
Se - Selenium
Ag - Silver
Tl - Thallium

TABLE 4-2

ACID GENERATING POTENTIAL AND ACID NEUTRALIZING POTENTIAL

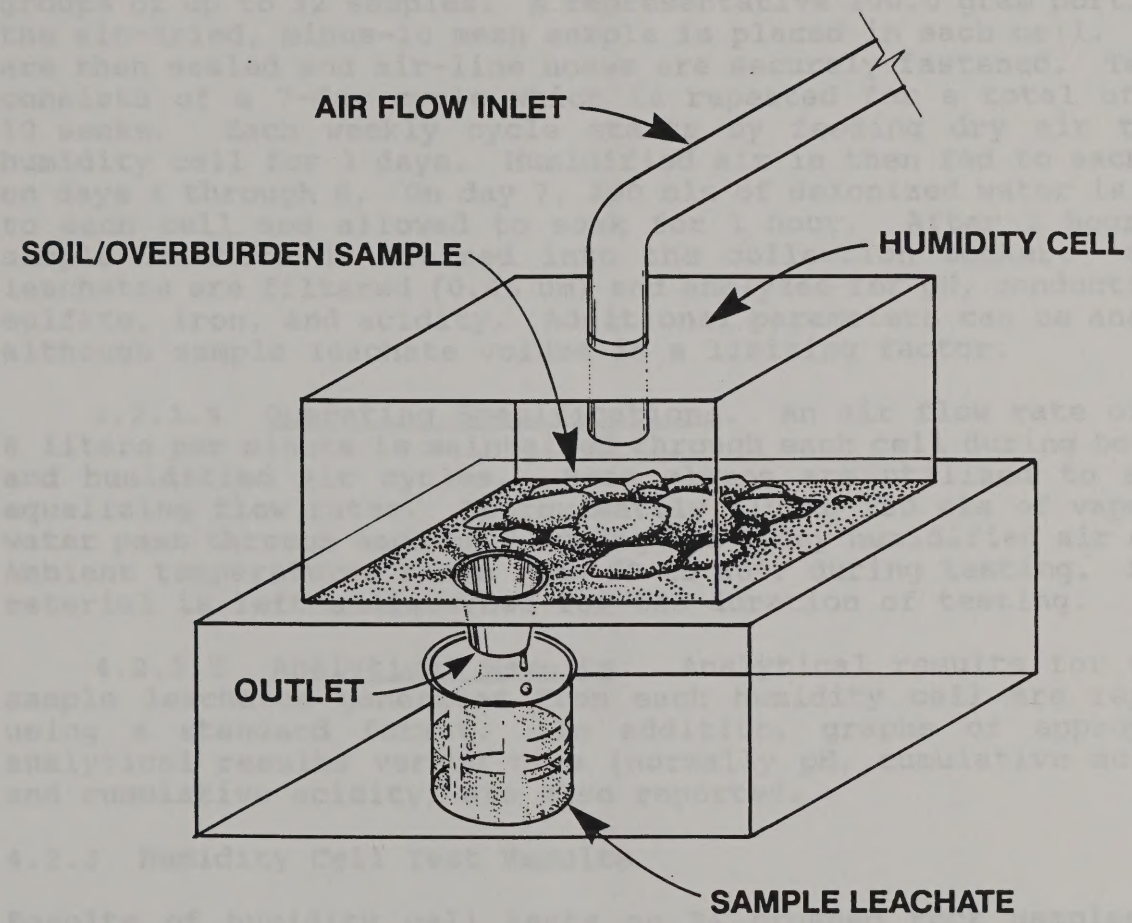
FROM WHOLE ROCK ANALYSES

Sample (Lab ID)[1]	Rock Type[2]	Total $CaCO_3$/kT AGP	Total $CaCO_3$/kT ANP	Net ANP (ANP - AGP)
WR-1	Sed	0.0	61.3	61.3
WR-1P	Sed	0.0	46.4	46.4
WR-2	Sed/O	45.3	0.0	-45.3
WR-2P	Sed/O	5.0	3.8	-1.2
WR-3	Gd	0.0	63.0	63.0
WR-3P	Gd	0.0	40.0	40.0
WR-4	Sed	52.8	0.2	-52.6
WR-4P	Sed	90.3	0.4	-89.9
WR-5	Gd	13.1	52.3	39.2
WR-5P	Gd	18.8	171.4	152.6
WR-6	Gd	22.5	221.0	198.5
WR-6P	Gd	13.1	224.2	211.1
WR-7	Gd	49.7	107.0	57.3
WR-7P	Gd	21.6	122.1	100.5
WR-8	Sed/O	39.1	0.0	-39.1
WR-8P	Sed/O	18.1	4.8	-13.3
WR-9	Sed	0.6	3.2	2.6
WR-9P	Sed	0.0	3.8	3.8
WR-10	Sed	0.3	6.4	6.4
WR-10P	Sed	0.0	13.9	13.9
WR-11	Sed	0.0	2.4	2.4
WR-11P	Sed	74.1	0.4	-73.7
WR-12	Gd	5.0	163.0	158.0
WR-12P	Gd(skarn)	0.6	191.0	190.4
WR-13	Sed	60.0	7.2	-52.8
WR-13P	Sed	12.5	15.0	2.5
B-1	Sed	0.0	1.8	1.8
B-2	Sed	0.0	2.0	2.0
B-3	Sed	9.7	7.2	-2.5
B-4	Sed	46.9	17.5	-29.4
B-5	Sed	0.3	0.1	-0.2
B-6	Sed	32.3	8.0	-24.3
B-7	Gd	2.8	3.6	0.8
B-8	Sed	10.3	1.5	-8.8
B-9	Sed	29.1	7.2	-21.1
B-10	Gd	98.8	48.3	-50.5
B-11	Gd	1.2	107.2	106.0
B-12	Gd	0.0	125.0	125.0
B-13	Gd/O	35.3	75.1	39.8
B-14	Gd/O	12.2	42.4	30.2
B-15	Sed	40.6	8.5	-32.1
Average for Granodiorite[1]		20.7	104.2	83.6
Average for sedim. rocks[1]		19.5	18.0	-1.5
Average for pit, 24% Gd, 76% Sed.		19.8	38.7	18.9

Source: Core Laboratories Analytical Reports 900318 and 900805.

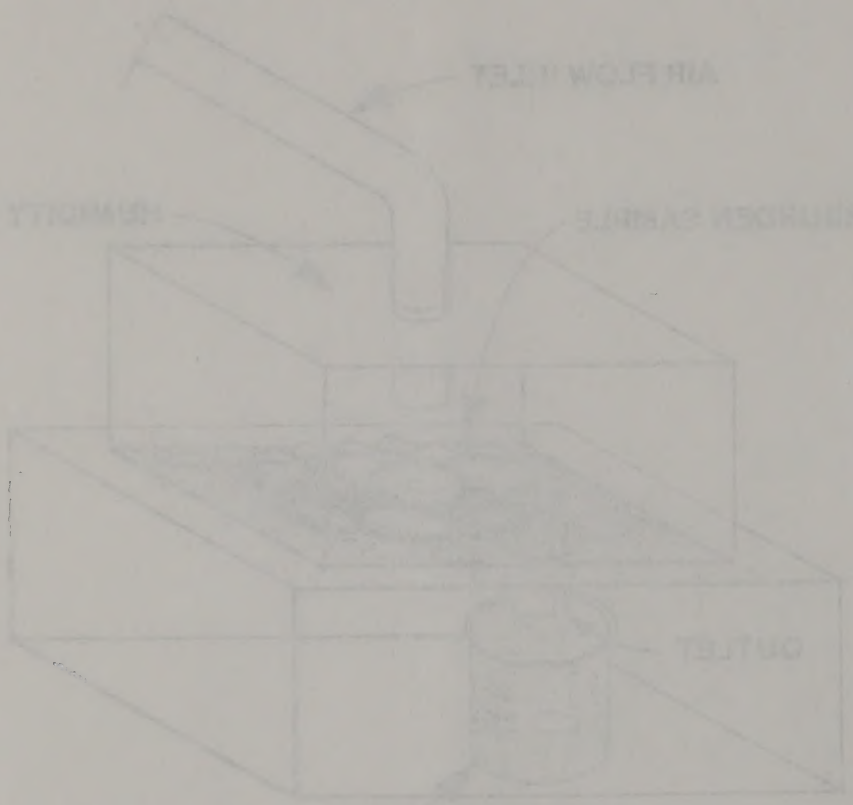
[1]Designation P is a second analysis from a similar core interval. Sample WR-11 is a replicate of sample WR-10, sample WR-11P is a replicate of WR-4P, and sample B-15 is a replicate of B-6. The averaging scheme has been weighted to take replication into account.

[2]Sed = sedimentary rocks; Gd = granodiorite and related rocks; O = ore.



BETZE PROJECT

Figure 4-1. Diagram of Humidity Cell Apparatus (after Core Laboratories, 1990d)



connected to two dispersion air-stones. Compressed air can be fed directly to the humidity cells (dry air cycle) or pumped through the carboy first and then routed to the humidity cells (humidified air cycle). Humidity cells are placed on wire racks during testing. Sample leachates are collected using glass beakers located beneath the drain fitting of each cell (see Figure 4-1).

4.2.1.3 Test Procedure. Humidity cell tests can be run on groups of up to 12 samples. A representative 200.0 gram portion of the air-dried, minus-10 mesh sample is placed in each cell. Cells are then sealed and air-line hoses are securely fastened. Testing consists of a 7-day cycle which is repeated for a total of 8 to 10 weeks. Each weekly cycle starts by feeding dry air to the humidity cell for 3 days. Humidified air is then fed to each cell on days 4 through 6. On day 7, 200 mls of deionized water is added to each cell and allowed to soak for 1 hour. After 1 hour, the sample leachate is drained into the collection beaker. Sample leachates are filtered (0.45 um) and analyzed for pH, conductivity, sulfate, iron, and acidity. Additional parameters can be analyzed although sample leachate volume is a limiting factor.

4.2.1.4 Operating Specifications. An air flow rate of 5 to 8 liters per minute is maintained through each cell during both dry and humidified air cycles. Hose clamps are utilized to aid in equalizing flow rates. Approximately 110 to 150 mls of vaporized water pass through each cell during the 3-day humidified air cycle. Ambient temperatures range from 60 to 80°F during testing. Sample material is left undisturbed for the duration of testing.

4.2.1.5 Analytical Results. Analytical results for weekly sample leachates generated from each humidity cell are reported using a standard format. In addition, graphs of appropriate analytical results versus time (normally pH, cumulative sulfate, and cumulative acidity) are also reported.

4.2.2 Humidity Cell Test Results

Results of humidity cell tests on 24 crushed rock samples from drill holes within the area of the proposed Betze Pit are presented in Table 4-3. The results generally confirm the static tests or whole rock analysis in that 8 of the samples generated acidity, 13 generated no acidity, and 3 were borderline. These relative proportions indicate that taken as a whole, the samples would likely consume acid. During weeks 1, 2, and 10 of the tests the leachate was analyzed for the same 15 metals (refer to Section 4.1.1 Description of Analysis Procedures) that were tested for in the whole rock analysis. The results indicate that arsenic levels were high only when pH was below 5.0. Furthermore, no other trace elements were liberated in significant concentrations from the samples.

TABLE 4-3

HUMIDITY CELL TEST RESULTS

Sample I.D.	Rock Type	Ox/Ref	Core Length Feet	Humidity Cell Test Results: Acidity (filt.) mg/l - $CaCO_3$	Conduct. (filt.) umhos/cm @ 25dF	pH (filt.)	Sul (filt.) mg/l	As Diss. mg/l	Ba Diss. mg/l	B Diss. mg/l	Cd Diss. mg/l	Cr Diss. mg/l	Cu Diss. mg/l	Fe Diss. mg/l	Pb Diss. mg/l	Hg Diss. mg/l	Mg Diss. mg/l	Mn Diss. mg/l	Ni Diss. mg/l	Se Diss. mg/l	Ag Diss. mg/l	Tl Diss. mg/l
WR-1P	Sed	Ox	100	<10	336.0	6.24	131	0.83	0.02	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	4.32	0.73	<0.04	<0.1	<0.01	<0.1
WR-2P	Sed/O	Ref	100	24	601.0	6.21	275	0.16	0.02	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	8.52	0.11	<0.04	<0.1	<0.01	<0.1
WR-3P	Gd	Ref	100	<10	75.0	7.46	<10	0.08	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	1.37	<0.01	<0.04	<0.1	<0.01	<0.1
WR-4P	Sed	Ox	65	<10	74.0	7.21	<10	<0.05	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	1.48	<0.01	<0.04	<0.1	<0.01	<0.1
WR-5P	Gd	Ref	150	14	1,000.0	6.23	528	0.47	0.03	<0.05	<0.005	<0.01	<0.01	0.03	<0.05	<0.0015	65.00	0.64	<0.04	<0.1	<0.01	<0.1
WR-6P	Gd	Ref	75	<10	98.0	5.85	35	<0.05	0.05	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	1.70	3.02	0.09	<0.1	<0.01	<0.1
WR-7P	Gd	Ref	70	<10	275.0	6.27	110	<0.05	0.05	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	1.78	0.66	<0.04	<0.1	<0.01	<0.1
WR-8P	Sed/O	Ref	60	167	790.0	3.26	386	3.14	<0.01	<0.05	0.107	<0.01	0.75	26.00	<0.05	<0.0015	15.50	1.14	2.42	<0.1	<0.01	<0.1
WR-9P	Sed	Ox	100	11	64.0	5.41	20	0.07	0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	0.93	0.13	<0.04	<0.1	<0.01	<0.1
WR-10P	Sed	Ox	100	35	319.0	4.10	120	0.10	0.01	<0.05	<0.005	<0.01	0.71	1.35	<0.05	<0.0015	6.93	0.37	1.37	<0.1	<0.01	<0.1
WR-11P	Sed	Ox	65																			
WR-12P	Gd	Ref	80	<10	18.0	6.60	<10	0.06	<0.01	<0.05	<0.005	<0.01	<0.01	0.12	<0.05	<0.0015	0.07	<0.01	<0.04	<0.1	<0.01	<0.1
WR-13P	Sed	Ox	100	<10	70.0	5.73	23	0.41	<0.01	<0.05	<0.005	<0.01	0.04	0.05	<0.05	<0.0015	1.13	0.12	0.10	<0.1	<0.01	<0.1
B-1	Sed	Ox	200	<10	191.0	5.54	70	<0.05	0.02	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	3.06	3.06	0.15	<0.1	<0.01	<0.1
B-2	Sed	Ox	165	<10	125.0	6.87	30	0.11	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	1.61	0.03	<0.04	<0.1	<0.01	<0.1
B-3	Sed	Ox	200	<10	22.0	6.55	<10	0.13	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	0.19	<0.01	<0.04	<0.1	<0.01	<0.1
B-5	Sed	Ox	150	<10	24.0	6.61	<10	<0.05	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	0.02	<0.01	<0.04	<0.1	<0.01	<0.1
B-6	Sed	Ox	250	292	1,230.0	3.26	696	0.21	<0.01	<0.05	0.777	0.03	5.19	22.00	<0.05	<0.0015	12.00	5.23	3.76	<0.1	<0.01	<0.1
B-8	Sed	Ref	100	<10	123.0	6.69	30	0.15	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	2.32	0.02	<0.04	<0.1	<0.01	<0.1
B-9	Sed	Ref	150	<10	165.0	6.78	48	0.07	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	3.98	<0.01	<0.04	<0.1	<0.01	<0.1
B-10	Gd	Ref	150	<10	87.0	7.12	11	0.13	<0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	2.63	0.06	<0.04	<0.1	<0.01	<0.1
B-11	Gd	Ref	325	102	483.0	3.56	207	19.40	0.02	<0.05	<0.005	<0.01	0.07	65.00	<0.05	<0.0015	7.50	6.50	0.42	<0.1	<0.01	<0.1
B-12	Gd	Ref	75	<10	64.0	7.75	<10	<0.05	<0.01	<0.05	<0.005	<0.01	0.01	0.22	<0.05	<0.0015	1.18	0.02	<0.04	<0.1	<0.01	<0.1
B-13	Gd/O	Ref	180	21	133.0	4.76	48	0.47	0.05	<0.05	0.006	<0.01	0.05	0.79	<0.05	<0.0015	2.46	11.30	0.80	<0.1	<0.01	<0.1
B-14	Gd/O	Ref	200	<10	64.0	7.43	10	<0.05	0.01	<0.05	<0.005	<0.01	<0.01	<0.03	<0.05	<0.0015	0.65	0.04	<0.04	<0.1	<0.01	<0.1
B-15	Sed	Ox	250																			

Sed - Sedimentary Rocks
O - Indicates Ore
Gd - Granodirite and Relate Rocks
Ox - Oxidized
Ref - Refactory
Net ANP - Net Acid Neutralizing Potential (ANP-AGP)
AGP - Acid Generating Potential
Conduct. - Conductivity
Sul - Sulfate
filt. -
Diss. - dissolved
* - Tons $CaCO_3$/1,000 Tons

As - Arsenic
Ba - Barium
B - Boron
Cd - Cadmium
Cr - Chromium
Cu - Copper
Fe - Iron
Pb - Lead
Hg - Mercury
Mg - Magnesium
Mn - Manganese
Ni - Nickel
Se - Selenium
Ag - Silver
Tl - Thallium

5.0 GEOCHEMICAL COMPUTATIONS

5.1 Assumptions and Computation Procedures

5.1.1 Concentration by Evaporation

The effect of evaporation was calculated from the hydrologic data provided by Legette, Brashears & Graham, Inc. (see Table 3-1). Evaporation is relatively insignificant on the time-scale considered, causing a rise in the concentrations of conservative solutes of 35 percent by the year 2100. Eventually (after about 200 years, Legette, Brashears & Graham, Inc. 1990) the lake will reach a hydrologic steady state with the inflow from groundwater estimated to be 1.8 cfs, outflow 0.8 cfs, and evaporation 0.98 cfs (Legette, Brashears & Graham, Inc. 1990). This implies that when the lake reaches a chemical steady state (some time after it reaches a hydrologic steady state), the concentrations of conservative solutes will be increased by a factor of 2.25.

5.1.2 WATEQF Computer Model

WATEQ4F is the current PC-based version of WATEQF (Plummer et al. 1976), which was developed by the U.S. Geological Survey for equilibrium calculations in natural waters. The program takes water quality data as input. These data consist of concentrations of dissolved species, pH, water temperature, and redox potential. WATEQ4F allows several options for computing redox conditions depending on input parameters. Redox conditions can be computed from measured Eh (electrode measured redox potential), concentration of dissolved oxygen, or the ratio SO4-2/S-2 (provided SO4-2 and H_2S are known).

Redox parameters were not available, so waters were assumed to be in equilibrium with atmospheric oxygen (a reasonable assumption for a lake that experiences frequent turn over and has low organic matter). WATEQ4F requires that there is a reasonable balance (within 20 percent) between dissolved positively and negatively charged species (electrical neutrality). This condition was met with the water data used. An average annual water temperature was assumed to be 15°C.

From the chemical analysis of water, WATEQ4F computes the activities of dissolved species from the Debye-Huckel or the extended Davies equation (depending on the ionic strength of the solution). The activities of dissolved species are used to compute saturation with respect a range of solid phases. The computation uses the mass action equation and a large database of common minerals and their thermodynamic constants.

The output from WATEQ4F consists of the following:

1. A table of data constants used in the calculations,

2. The thermodynamic activities and activity coefficients of all dissolved species,

3. Speciation -- the concentrations of actual species in solution, including complexes, and

4. The state of saturation of the solution with respect to a range of solid phases. By "state of saturation" we mean the degree to which the solution is supersaturated or undersaturated with respect to a particular phase. The data base contains essentially all minerals for which solubility data are available.

5.2 Betze Lake Water Composition

5.2.1 Water Composition Excluding Reaction with Wall Rock

If reactions with the pit wall are ignored for the moment, the water in the pit can be predicted by assuming:

a. Evaporation as discussed in Section 5.1.1.

b. Loss of carbon dioxide to an equivalent CO_2 pressure of about $10^{-3.0}$ atmospheres. This is slightly higher than the atmospheric value ($10^{-3.5}$ atm), and is typical of oligotrophic lakes. Carbon dioxide pressure is specified in order to calculate pH and the solubility of calcium carbonate.

c. Precipitation of solid phases with which the water is supersaturated (calcite and oxyhydroxides of aluminum, iron, and manganese). Saturation state was calculated with the aid of the computer code WATEQ4F.

The predicted water compositions are shown in Table 5-1. The concentrations of sodium, potassium, calcium, magnesium, sulfate, fluoride, and most trace elements are the inflow values concentrated by 35 percent (year 2100) and 225 percent (steady state); calcium and alkalinity are decreased by precipitation of calcite, aluminum by precipitation of a hydroxide or aluminosilicate, and iron and manganese by precipitation of oxyhydroxides. The pH would be around 8.3 to 8.5. This water appears to meet all drinking water standards at the year 2100. The predicted arsenic concentration is close to the drinking water standards at 2100 (0.04 mg/L vs. 0.05 mg/L) and slightly above it at steady state (0.06 mg/L). The predicted arsenic values may be slightly high, as some arsenic would likely coprecipitate with iron and manganese oxyhydroxides (the natural process would be analogous

TABLE 5-1

PREDICTED PIT WATER COMPOSITION[1]

(mg/l EXCEPT pH) IN YEAR 2100 AND AT STEADY STATE

	2100	Steady State[2]
Alkalinity (as $CaCO_3$)	194.73	299.22
Aluminum (Al)	0.05	0.05
Arsenic (As)	0.04	0.06
Boron (B)	0.57	0.95
Cadmium (Cd)	0.01	0.01
Calcium (Ca)	8.96	4.44
Chloride (Cl)	39.20	65.53
Copper (Cu)	0.02	0.03
Cyanide (CN)	0.01	0.02
Fluoride (F)	1.29	2.16
Iron (Fe) (D)	0.10	0.10
Lead (Pb)	0.02	0.03
Magnesium (Mg)	33.50	56.00
Manganese (Mn)	0.06	0.10
Nickel (Ni)	0.02	0.03
Nitrate (NO_3)	0.75	1.26
Phosphate (PO_4)	0.08	0.14
Potassium (K)	21.55	36.02
Silica (SiO_2)	43.11	72.07
Sodium (Na)	78.52	131.25
Sulfate (SO_4)	123.74	206.85
Zinc (Zn)	0.07	0.12
Total Dissolved Solids (TDS)	470.00	759.00
pH	8.30	8.48

[1] Assuming no reaction between inflow and pit wallrock.

[2] More than 200 years into the future.

to the water treatment currently used by Barrick to remove arsenic from their pumped water). Arsenic removal by adsorption is further discussed in Section 6.4. The uncertainty associated with the predicted arsenic concentration is probably about a factor of 3.

5.2.2 Water Composition Including Reaction with Wall Rock

5.2.2.1 Acid Potential of Wall Rock. The critical question is whether the acid generating potential of the sulfur in the rock is greater or less than the acid neutralizing potential of the carbonate minerals in the rock. This can be evaluated by the so-called static test, based on the chemical composition of the rock, and the so-called dynamic test, in which the rock is exposed to water in a humidity cell and the generation of acidity is measured (Steffen Robertson and Kirsten 1989).

Static Tests. An average composition for the rocks that will surround the pit was calculated by computing averages for the sedimentary rock and for the granodiorite based upon whole rock analyses (Core Laboratories 1990a, 1990b, 1990c) (see Table 4-2). For the sedimentary rocks, the acid generating potential and acid neutralizing potential are approximately equal; for the granodiorite, however the acid neutralizing potential is much greater than the acid generating potential. The mean composition for the pit wall was calculated as 24 percent of the granodiorite value plus 76 percent of the sedimentary rock value (see Table 3-4). With these proportions, the acid neutralizing potential of the pit wall rock as a whole is approximately twice the acid generating potential. The relative proportion of sedimentary rock and granodiorite in contact with water will vary somewhat if the pit is partially filled to different depths, but sufficient granodiorite will be in contact with the water at any level to assure neutralization (see Figure 3-2). This suggests that the pit water will not become acid under any plausible circumstances.

Dynamic Tests. Humidity cell tests were conducted on 24 composite rock samples (Core Laboratories 1990c). Leachates were analyzed for acidity and sulfate weekly for ten weeks, and for arsenic and other trace elements after 1, 2, and 10 weeks. The results can be summarized as follows:

1. Of the 24 samples, 8 generated significant acidity, 13 generated no acidity, and 3 were borderline. These relative proportions are consistent with what would be predicted from the static tests.

2. High arsenic concentrations were generated only when the pH was below 5, and not all acid leachates contained high arsenic concentrations (Figure 5-1).

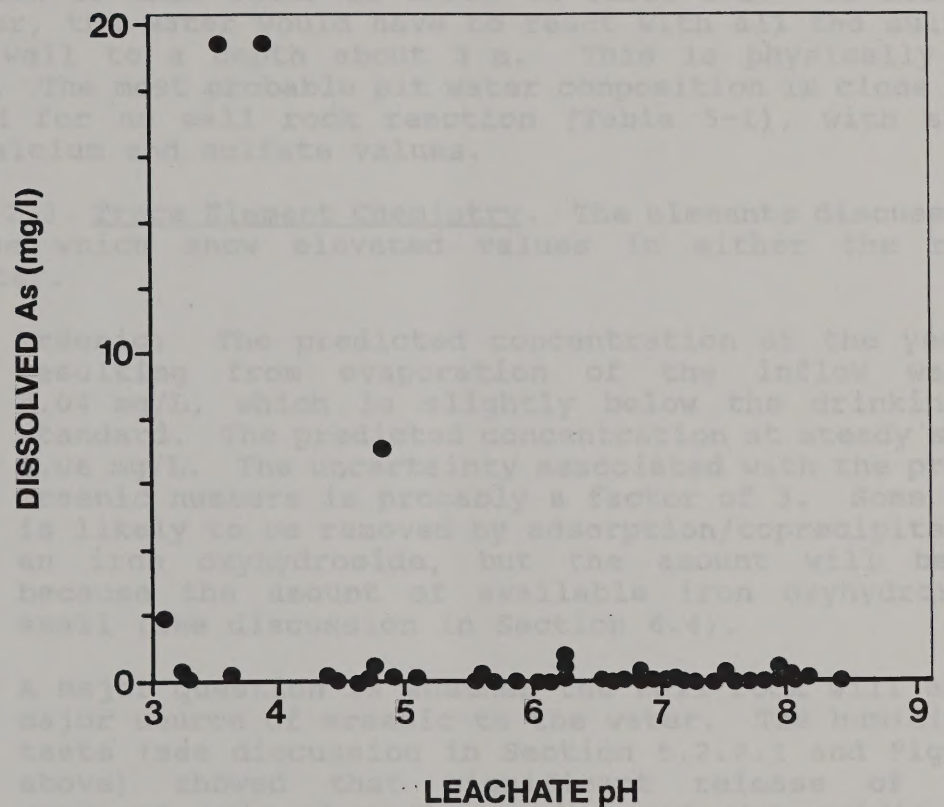


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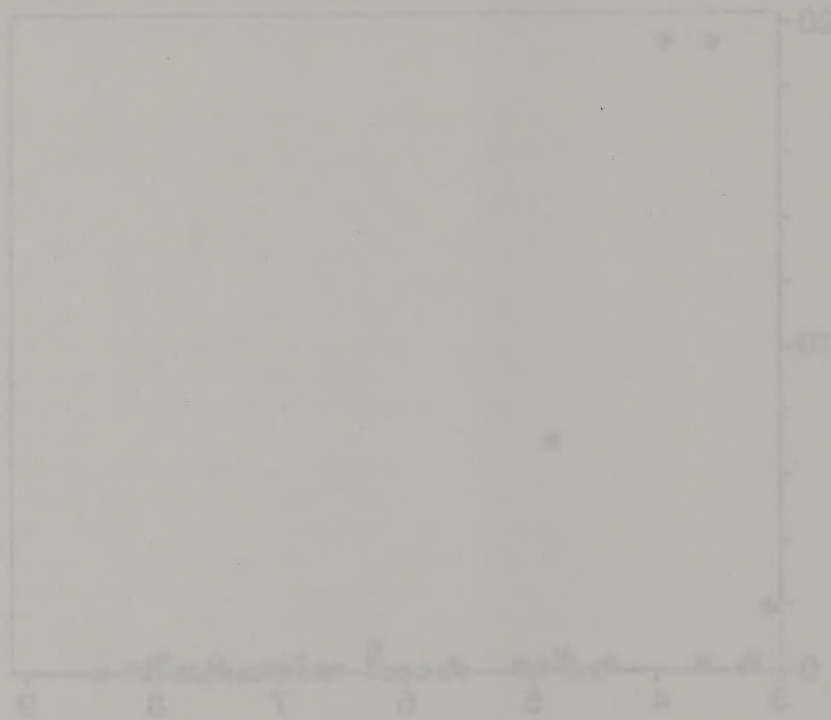
Figure 5-1. Dissolved Arsenic versus pH for All Humidity Cell Tests (Weeks 1, 2, and 10)



3. No trace elements other than arsenic appeared in significant concentrations.

5.2.2.2 Major Element Chemistry of Pit Water. As stated above, acidification should not be a problem. As sulfides oxidize, the acidity generated will react with calcite in the wall rock (or alkalinity in solution) to produce a calcium-sulfate type water. Thus, progressive reaction will cause a rise in calcium and sulfate concentrations, a decrease in bicarbonate concentration, and a slight drop in pH. As an extreme end-member, the water could reach gypsum saturation, after which its composition would be essentially unchanged by further reaction with the wall rock. The estimated composition of this water is shown in Table 5-2. To reach this end-member, the water would have to react with all the sulfide in the pit wall to a depth about 3 m. This is physically highly unlikely. The most probable pit water composition is close to that predicted for no wall rock reaction (Table 5-1), with slightly higher calcium and sulfate values.

5.2.2.3 Trace Element Chemistry. The elements discussed here are those which show elevated values in either the rock or groundwater.

- Arsenic: The predicted concentration at the year 2100 resulting from evaporation of the inflow water is 0.04 mg/L, which is slightly below the drinking-water standard. The predicted concentration at steady state is 0.06 mg/L. The uncertainty associated with the predicted arsenic numbers is probably a factor of 3. Some arsenic is likely to be removed by adsorption/coprecipitation on an iron oxyhydroside, but the amount will be small because the amount of available iron oxyhydroxide is small (see discussion in Section 6.4).

  A major question is whether the wall rock will act as a major source of arsenic to the water. The humidity cell tests (see discussion in Section 5.2.2.1 and Figure 5-1 above) showed that significant release of arsenic occurred only when the environment was acidic. Even though local areas of the pit wall rock have the potential to generate acidity, there should be sufficient mixing of the pit water to neutralize these local "hot spots," so that the pit walls below the level of the water surface should not be a significant source of dissolved arsenic. It is possible that "hot spots" may occur in the pit wall above the water level. In view of the dry climate and the volume and alkalinity of inflow water, it is unlikely that such "hot spots" would have a significant effect on the overall chemistry of the waterbody in the Betze Pit.

TABLE 5-2

PREDICTED PIT WATER COMPOSITION[1]

(mg/l EXCEPT pH) IN YEAR 2100 AND AT STEADY STATE

	2100	Steady State[2]
Alkalinity (as $CaCO_3$)	38.66	39.78
Aluminum (Al)	0.05	0.05
Arsenic (As)	0.04	0.06
Boron (B)	0.57	0.95
Cadmium (Cd)	0.01	0.01
Calcium (Ca)	503.99	496.83
Chloride (Cl)	39.20	65.53
Copper (Cu)	0.02	0.03
Cyanide (CN)	0.01	0.02
Fluoride (F)	1.29	2.16
Iron (Fe) (D)	0.10	0.10
Lead (Pb)	0.02	0.03
Magnesium (Mg)	33.50	56.00
Manganese (Mn)	0.06	0.11
Nickel (Ni)	0.02	0.03
Nitrate (NO_3)	0.75	1.26
Phosphate (PO_4)	0.08	0.14
Potassium (K)	21.55	36.02
Silica (SiO_2)	43.11	72.07
Sodium (Na)	78.52	131.25
Sulfate (SO_4)	1,310.17	1,386.92
Zinc (Zn)	0.07	0.12
Total Dissolved Solids (TDS)	2,056.00	2,273.00
pH	7.56	7.57

[1]Assuming maximum possible reaction between inflow and pit wallrock.

[2]More than 200 years into the future.

- Aluminum: Concentrations will be insignificant at pH of about eight because of the insolubility of the hydroxide or an aluminosilicate. The high values reported in some of the inflow waters probably reflect particulate aluminum rather than dissolved (the samples were unfiltered).

- Barium: Concentrations will be insignificant because of the insolubility of barium sulfate.

- Copper, chromium, lead: Should all be insoluble at pH 8. The humidity cell tests show no significant release of these elements.

- Iron and manganese: Concentrations should be low in oxidizing water at pH 8 (insoluble oxides/oxyhydroxides).

5.2.3 Effect of Partial Backfill Alternative

The effect of backfilling the pit on water quality can be predicted qualitatively. The major differences from an open waterbody would be the greater amount of rock available to react with the water, and the decreased contact with the atmosphere. The backfill material would presumably contain some sulfides, and some products of sulfide oxidation during handling and intermediate storage (sulfates, iron oxyhydroxides with adsorbed trace elements).

Any sulfates present in the waste rock would dissolve rapidly, causing an immediate increase in the salinity of the enclosed water. Sulfides in the waste rock would oxidize until oxygen in the water became depleted. This would tend to increase calcium and sulfate concentrations. After oxygen was depleted, the water would become reducing; iron oxyhydroxides would tend to dissolve, releasing adsorbed arsenic, and arsenic would tend to be reduced from the +V to the +III oxidation state, which would result in desorption and elevated concentrations in solution.

The water in the backfill material would be of relatively poor quality. It would be more saline than present-day groundwater and would contain elevated concentrations of arsenic.

5.2.4 Water Composition of Post Pit (No Action)

The No Action Alternative would involve continued mining of the Post Pit for one or two additional years resulting in a pit that would be smaller than the proposed Betze Pit. Water would accumulate in the pit over a number of decades forming a waterbody that would be similar to the waterbody in the Betze Pit, but smaller in size. The quality of this waterbody can be estimated qualitatively. The Post Pit is presently below the groundwater level of about 5,300 feet and is excavated into sulfide and oxide ore from the Post ore body. Although the Post ore body would be

almost depleted by the present operation, the Betze ore body with associated high arsenic-containing rocks would remain in place. Therefore, groundwater refilling the Post Pit may come in contact with high arsenic rocks and may contain higher levels of arsenic than the waterbody which would form under the Proposed Action. The inflow, outflow, and evaporation from the No Action Alternative would be roughly the same as for the Proposed Action and would result in similar concentrations of constituents other than arsenic. The potential for increased concentrations of arsenic in the Post Pit waterbody could result in a significant impact to water quality under the No Action Alternative.

The Post Pit would have physical characteristics similar to those of the proposed Betze Pit. The pit waterbody would be on the order of several hundred feet deep with steep slopes at the edge and a shoreline which would be approximately round. There would be little area for littoral development and macrophytic growth would be minimal. With the exception of arsenic, the chemical composition of the Post Pit waterbody would be similar to the Betze Pit waterbody resulting in similar productivity. The Post Pit waterbody would most likely resemble an oligotrophic system and there would be limited potential for the development of aquatic life.

5.3 Seepage from Waste Rock Disposal Sites

Under the proposed plan to develop the Betze Pit approximately 815 million tons of waste rock would be disposed of in waste rock disposal areas up to 600 feet in depth on areas adjacent to the pit. The waste rock will contain sulfide minerals from the ore body. The waste rock will also contain locally high levels of arsenic excavated during the mining process. Seepage of direct precipitation through the waste rock may become acidic due to oxidation of sulfide minerals in the rock. The acidic seepage may then dissolve heavy metals, such as arsenic, from the rock that would otherwise have remained immobile. The acidic seepage may percolate through the waste rock into the groundwater beneath the site or it may seep out the base of the waste rock to a surface water drainage.

Water quality impacts due to the waste rock disposal areas will depend on the rate of seepage through the waste rock and on the occurrence of acid generating materials within the waste rock. The following two sections describe the modeling process utilized to estimate the amount of seepage and/or runoff from the waste rock and the laboratory analyses utilized to estimate the potential of waste rock to generate acid. Control of either seepage through the waste rock or location of acid generating materials will prevent water quality impacts from waste rock disposal areas.

5.3.1 Modeling of Seepage Through Waste Rock

The movement of water through the proposed waste rock disposal areas was evaluated using the computer program Hydrologic Evaluation of Landfill Performance (HELP). HELP is a quasi-two-dimensional hydrologic model of water movement across, into, through, and out of landfills. The model accepts inputs of climatologic, soil, and design data and predicts surface storage, runoff, infiltration, percolation, evapotranspiration, and lateral drainage. HELP has an internal database consisting of climatologic data for selected representative cities throughout the United States, and physical and hydraulic parameters for a wide range of representative soil types. These data may be used in model applications or, if available, site specific climatologic and soil data may be used. HELP was developed at the U.S. Army Corps of Engineers Waterways Experiment station (Schroedeer et at. 1984) and is currently supported by the EPA.

For this application, climatologic data for Ely, Nevada (annual precipitation of 8.78 inches) contained in the HELP default database was used. HELP was run for two basic situations, exposed waste soil, and waste soil with a layer of vegetated, clean soil on top. In the first case, the hydraulic conductivity of the waste soil, and waste soil with a layer of vegetated, clean soil on top was varied to determine the effect on percolation through the pile. The waste was characterized as a mixture of loam, sand, and coarse gravel. A range of soil types including sand, coarse sandy loam, and coarse sand, with respective conductivities of 6.6, 7.1, and 11.95 in/hr, were chosen to represent the waste soil. based on the average depth of the proposed "extended south" waste rock disposal area, the waste soil depth chosen was 600 feet. The resulting percolation through the bottom of the waste pile increased with increasing conductivity, ranging from an annual average of 0.97 to 1.31 inches. The model predicted that there would be no runoff from the waste material, and that most of the precipitation falling on the waste piles would be lost back into the atmosphere by evapotranspiration.

Next, a layer of vegetated sandy loam (conductivity, K = 0.67in/hr) was added to the top of the waste. Three depths of topsoil, 1,2 and 10 feet, were modeled with HELP. The surface was assumed vegetated with good grass, which was expected to improve runoff. HELP predictions, however, showed no runoff, as with the exposed waste runs. This is presumably due to Nevada's low annual precipitation. HELP predicted average annual percolation rates of 1.43, 1.37, and 1.33 inches for the 1,2, and 10-foot depths. These rates are slightly higher than those for the exposed waste soil.

In order to evaluate the potential for increased lateral drainage, the model was run with a 2-foot layer of gravel (K = 12 in/hr) added to the topsoil. The gravel was situated between two, 5-foot sections of sandy loam. The result of adding this layer was to

reduce percolation from 1.33 to 1.30 inches. A small amount of drainage, 0.001 inch, was predicted.

In addition, several model runs were made to determine the effect of compacted layers within the waste rock on percolation through the base of the piles. According to Barrick personnel (V. Sawyer 1990), the waste rock disposal areas are expected to have a 6-foot thick compacted layer every 100 feet of depth due to compaction by machinery. Model runs indicate that there is no change in percolation for the case in which the waste rock is covered with a layer of vegetated soil. However, for the case with a bare waste rock cover, percolation is reduced about 15 percent over the case with vegetated soil cover. Presumably the compacted layers reduce the infiltration rate and allow for greater evapotranspiration of percolating water. In all cases, about 10 to 15 percent of all precipitation percolates through the waste rock.

Finally, percolation for the five waste disposal alternatives was modeled and compared. The depth of the waste soil layers ranged from 300 to 750 feet. The average annual percolation remained fairly constant among alternatives, ranging from 1.41 to 1.43 inches.

In conclusion, according to predictions made by the HELP computer model, runoff and lateral drainage are insignificant components of the hydrologic water budget at the site. The majority of precipitation is lost through evapotranspiration. Infiltration or percolation through the waste material was predicted to be relatively small, generally just over 1 inch. An overlying, vegetated soil layer was shown to have no effect on percolation through the waste.

5.3.2 Acid Generating Potential of Waste Rock

An estimate of the net acid neutralizing potential of waste rock was developed by averaging results of whole rock analysis for 35 waste rock samples (Table 5-3). A more detailed discussion of analysis procedures and results is presented in Section 4.1 Whole Rock Analysis. An estimate of net acid neutralizing potential is obtained by taking the difference between the acid generating potential as represented by total sulfur content of the rock sample and the acid neutralizing potential. A negative number indicates a potential for the sample to generate acid and a positive number indicates a potential for the sample to consume or neutralize acid.

Samples are averaged based upon the two major rock types recognized within the volume of material to be excavated from the Betze Pit (Table 5-3). The averages for each rock type are then weight-averaged based upon an estimate of the relative volumes of each rock-type to be excavated from the pit. An average net acid neutralizing potential of 23.8 Tons $CaCO_3$/1,000 Tons was thus obtained, which indicates that on the whole the waste rock has the

TABLE 5-3

ACID GENERATING POTENTIAL AND ACID NEUTRALIZING POTENTIAL

OF WASTE ROCK FROM WHOLE ROCK ANALYSES

Sample (Lab ID)[1]	Rock Type[2]	Total $CaCO_3$/kT		Net ANP (ANP - AGP)
		AGP	ANP	
WR-1	Sed	0.0	61.3	61.3
WR-1P	Sed	0.0	46.4	46.4
WR-3	Gd	0.0	63.0	63.0
WR-3P	Gd	0.0	40.0	40.0
WR-4	Sed	52.8	0.2	-52.6
WR-4P	Sed	90.3	0.4	-89.9
WR-5	Gd	13.1	52.3	39.2
WR-5P	Gd	18.8	171.4	152.6
WR-6	Gd	22.5	221.0	198.5
WR-6P	Gd	13.1	224.2	211.1
WR-7	Gd	49.7	107.0	57.3
WR-7P	Gd	21.6	122.1	100.5
WR-9	Sed	0.6	3.2	2.6
WR-9P	Sed	0.0	3.8	3.8
WR-10	Sed	0.3	6.4	6.4
WR-10P	Sed	0.0	13.9	13.9
WR-11	Sed	0.0	2.4	2.4
WR-11P	Sed	74.1	0.4	-73.7
WR-12	Gd	5.0	163.0	158.0
WR-12P	Gd (skarn)	0.6	191.0	190.4
WR-13	Sed	60.0	7.2	-52.8
WR-13P	Sed	12.5	15.0	2.5
B-1	Sed	0.0	1.8	1.8
B-2	Sed	0.0	2.0	2.0
B-3	Sed	9.7	7.2	-2.5
B-4	Sed	46.9	17.5	-29.4
B-5	Sed	0.3	0.1	-0.2
B-6	Sed	32.3	8.0	-24.3
B-7	Gd	2.8	3.6	0.8
B-8	Sed	10.3	1.5	-8.8
B-9	Sed	29.1	7.2	-21.1
B-10	Gd	98.8	48.3	-50.5
B-11	Gd	1.2	107.2	106.0
B-12	Gd	0.0	125.0	125.0
B-15	Sed	40.6	8.5	-32.1
Average for Granodiorite[2]		20.0	114.3	94.4
Average for sedim. rocks[2]		18.6	20.1	1.6
Average for pit, 24% Gd, 76% Sed.		18.9	42.8	23.8

Source: Core Laboratories 1990a, 1990b, 1990c.

[1]Designation P is a second analysis from a similar core interval. Sample WR-11 is a replicate of sample WR-10, sample WR-11P is a replicate of WR-4P, and sample B-15 is a replicate of B-6. The averaging scheme has been weighted to take replication into account.

[2]Sed = sedimentary rocks; Gd = granodiorite and related rocks; O = ore.

potential to consume or neutralize acid. The granodiorite has a net neutralizing potential of 94.4 Tons $CaCO_3$/1,000 Tons, and the Paleozoic sedimentary rocks have a net neutralizing potential of 1.6 Tons $CaCO_3$/1,000 Tons.

Individual samples show a potential to generate acid (see for instance, samples WR-4 and WR-4P) indicating that a portion of the waste rock could likely generate acidic leachate. This leachate will be neutralized if it comes into contact with acid neutralizing material within the waste rock. Humidity cell test results indicate that arsenic is released from samples of waste rock if pH is below about 5.0. Release of arsenic is associated with release of iron which most likely results from oxidation of sulfide minerals. Assuming oxygen is present, iron will precipitate out of solution in the form of oxyhydroxides upon neutralization of acidic leachate. Arsenic may be adsorbed or co-precipitated with the iron if iron occurs in sufficient quantities (see Section 6.4). Humidity cell test results indicate that iron occurs in sample leachate at about 20 times the concentration of arsenic, suggesting that significant co-precipitation of iron and arsenic could occur. For comparison, the existing arsenic treatment at the mine utilizes a ratio of from 4:1 to 7:1 iron to arsenic to effectively reduce the levels of arsenic in water pumped from dewatering wells.

5.3.3 Water Quality Impacts of Waste Rock Seepage

The impacts of seepage from waste rock disposal areas on water quality of groundwater and surface water resources can be evaluated in light of infiltration modeling and geochemical laboratory testing. The HELP model indicates that there would be no surface runoff from the waste rock areas whether the surfaces of the waste rock are topsoiled or reclaimed. This would indicate that the waste rock disposal areas would have no impact on surface water resources within the project area. The HELP model also indicates that about 10 percent of the annual precipitation at the project area percolates through the waste rock to the regional groundwater system. The remainder of the precipitation is lost to the atmosphere via evapotranspiration. Therefore, a relatively small volume of water is available for oxidation of sulfide minerals and subsequent percolation from the waste rock areas.

Results of the geochemical laboratory analyses indicate that the waste rock as a whole would not generate acidic seepage. This assumes that the waste rock is mixed so that seepage from areas that generate acid will subsequently pass through neutralizing waste rock. Any arsenic that is liberated during acid generation is likely to be adsorbed to iron oxyhydroxide compounds upon neutralization of acidic leachate. The water chemistry of waste rock seepage can only be discussed qualitatively. After passage through the waste rock seepage is likely to be somewhat similar to existing groundwater with some possible exceptions. Sulfate and TDS may be somewhat elevated over existing levels due to oxidation

of some of the waste rock material. The impact of waste rock disposal areas on water quality in the project area is not expected to be significant.

5.4 Seepage from Sulfide Ore Stockpiles

Sulfide ore would be stockpiled at two locations in the project area to store ore that would be used as mill feed from the year 2000 to 2010. Two locations are selected as part of the Proposed Action and three alternative sites are proposed. Seepage of direct precipitation through sulfide ore will likely become acidic due to oxidation of sulfide minerals. The acidic seepage might contain heavy metals, such as arsenic, dissolved from the sulfide ore. The acidic seepage could percolate through the ore into the groundwater beneath the site or it might seep out the base of the stockpile.

Water quality impacts due to sulfide ore stockpiles will depend on the rate of seepage through the ore and on the occurrence of acid generating materials within the ore. A previous section which discusses modeling of seepage through waste rock (Section 5.3.1) also applies to sulfide ore because the two materials possess similar physical characteristics. The results of infiltration modeling indicate that runoff from sulfide ore stockpiles would be negligible, and that a small portion of annual precipitation would percolate through the stockpile. The majority of precipitation would evaporate back to the atmosphere.

5.4.1 Acid Generating Potential of Sulfide Ore

An estimate of the net acid neutralizing potential of sulfide ore was developed by averaging results of whole rock analysis for 6 ore samples (Table 5-4). A more detailed discussion of analysis procedures and results is presented in Section 4.1, Whole Rock Analysis. An estimate of net acid neutralizing potential is obtained by taking the difference between the acid generating potential as represented by total sulfur content of the rock sample and the acid neutralizing potential. A negative number indicates a potential for the sample to generate acid and a positive number indicates a potential for the sample to consume or neutralize acid.

The ore samples have an average net acid neutralizing potential of -9.4 Tons $CaCO_3$/1,000 Tons which indicates that on the whole the sulfide ore has the potential to generate acid. Humidity cell test results indicate that arsenic is released from rock samples if pH is below about 5.0. Release of arsenic is associated with release of iron which most likely results from oxidation of sulfide minerals. Iron may precipitate out of solution upon neutralization of acidic leachate, and arsenic may co-precipitate with the iron (see Section 6.4). However, seepage from the sulfide ore stockpiles is not likely to be neutralized because most of the ore has the potential to generate acid. Therefore, seepage from the

TABLE 5-4

ACID GENERATING POTENTIAL AND ACID NEUTRALIZING POTENTIAL

OF ORE SAMPLES FROM WHOLE ROCK ANALYSES

Sample (Lab ID)[1]	Rock Type[2]	Total $CaCO_3$/kT		Net ANP (ANP - AGP)
		AGP	ANP	
WR-2	Sed/O	45.3	0	-45.3
WR-2P	Sed/O	5.0	3.8	-1.2
WR-8	Sed/O	39.1	0	-39.1
WR-8P	Sed/O	18.1	4.8	-13.3
B-13	Gd/O	35.3	75.1	39.8
B-14	Gd/O	12.2	42.4	30.2
Average (weighted for duplicates)		25.7	16.2	-9.4

Source: Core Laboratories 1990a, 1990b, 1990c.

[1]Designation P is a second analysis from a similar core interval. Sample WR-11 is a replicate of sample WR-10, sample WR-11P is a replicate of WR-4P, and sample B-15 is a replicate of B-6. The averaging scheme has been weighted to take replication into account.

[2]Sed = sedimentary rocks; Gd = granodiorite and related rocks; O = ore.

sulfide ore stockpiles, although small in volume, would most likely be acidic and contain somewhat elevated levels of arsenic.

5.4.2 Water Quality Impacts of Sulfide Ore Stockpiles

The impacts of seepage from waste rock disposal areas on water quality of groundwater and surface water resources can be evaluated in light of infiltration modeling and geochemical laboratory tests. The HELP model indicates that there will be no surface runoff from the sulfide ore stockpiles which would be collected inside the berm around the stockpiles. Surface water runoff from the watershed above the stockpiles would be diverted around the piles to prevent contamination of unimpacted waters. Seepage from the stockpiles would be acidic and would contain arsenic. Therefore, there is a potential for significant impact to groundwater from seepage through sulfide ore stockpiles.

6.0 ARSENIC IN THE BETZE PIT WATERS

The existence of high levels of arsenic in the rock to be mined from the Betze Pit (see Table 4-1) and high levels of arsenic in water currently pumped from dewatering wells suggest a potential for the occurrence of arsenic within water resources associated with development of the Betze Pit. The previous section presented estimates of arsenic concentrations in the Betze Pit waterbody at or slightly above the drinking water standard of 0.05 mg/l. Therefore, sections on arsenic geochemistry and arsenic toxicity are presented to increase the understanding of the occurrence of arsenic in the environment and its impact on aquatic species. A final section is presented discussing the potential for arsenic sorption by iron oxides under natural conditions within the pit.

6.1 Arsenic Geochemistry

Arsenic occurs commonly as a trace sulfide associated with sulfide ores. Arsenic derived from the weathering of ores exists as aqueous arsenic or as a precipitate of solid sulfide or adsorbed oxide/hydroxide. Its aqueous geochemistry is complex due to its range of oxidation states (V, III, 0, -III), but the reduced (As[III]) and oxidized (As[V]) forms predominate. Generally, the reduced form is more mobile and toxic than the oxidized form. Oxidized arsenic solubility is fairly low (low mobility) and behaves much like soil phosphate species. Speciation and precipitation is largely controlled by pH and Eh (redox potential - Figure 6-1; from Brookins 1988). Arsenic forms ligand-like anionic complexes (H_2AsO_4, $HAsO_4^{-2}$, etc.) and does not complex with $C\ell^-$ or SO_4^{-2} as do cationic metals. Complexation of arsenic (+III and +V) by dissolved organic matter increases its mobility by preventing sorption or coprecipitation with solid organics or inorganics. This greatly affects the movement or attenuation in groundwater.

Sorption and precipitation are probably the principal means of arsenic removal from solution. Under oxidizing conditions, anionic arsenic will weakly bond (sorb) to positively-charged ferric oxide and hydroxide surfaces or co-precipitate with iron or other metals. Sorption of As(V) is greater than As(III). However, sorbed As(V) can be remobilized as As(III) if reduction occurs. Under reducing conditions, arsenic sulfides (with iron and other metals) may form in the presence of sulfur or remain in solution as a mobile potential contaminant. The availability of sulfur for arsenic removal from solution is a key factor in mobilizing or stabilizing reduced arsenic.

Geochemical conditions in the deep lake environment favor low arsenic concentrations and the predominance of As(+V) over the reduced form. Acid buffering of lake waters by formation of carbonates maintains a neutral to alkaline pH and suggests that arsenic will stabilize in solution at low concentrations.

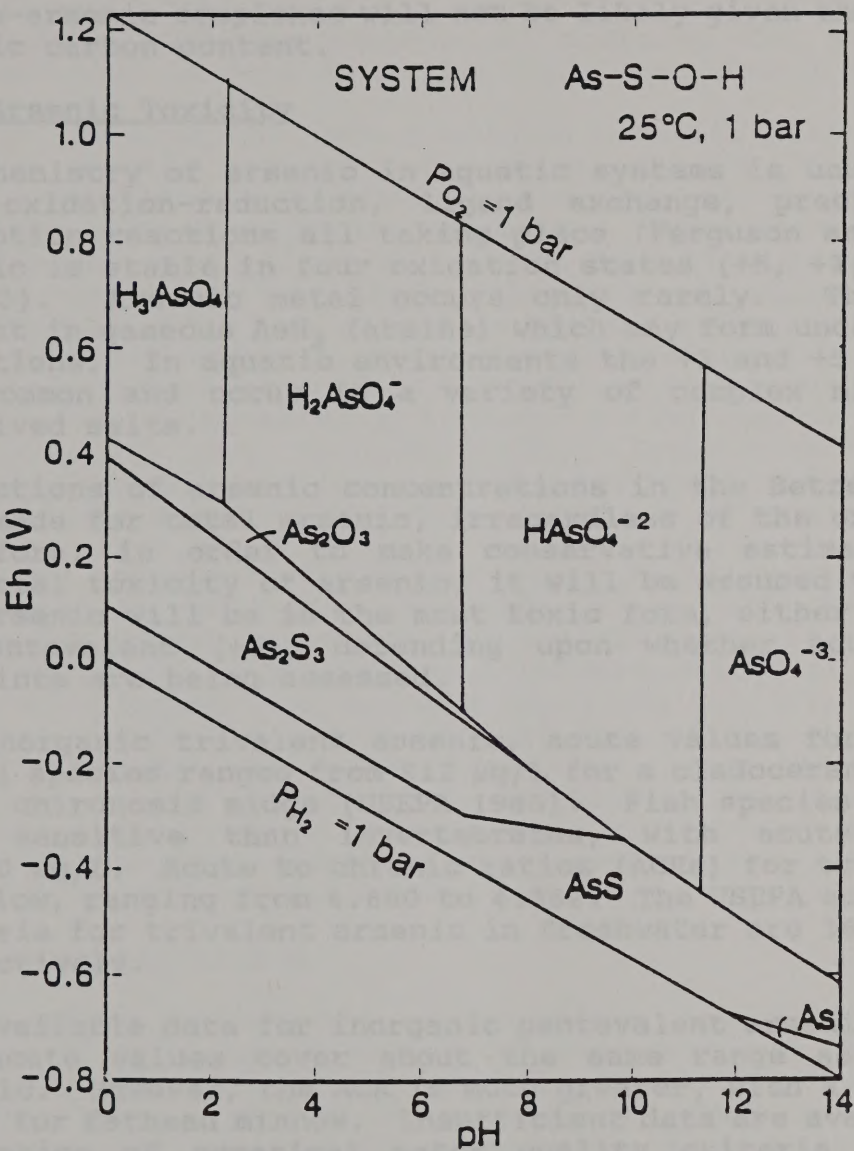


Figure 6-1. Eh-pH Diagram for Part of the System As-S-O-H. The Assumed Activities of Dissolved Species Are: As=10^{-6},S=10^{-3}.

Oxidizing conditions are expected for lake waters since organic content is low and biological activity is at a minimum. Also, thermally driven water circulation will probably maintain oxidizing conditions throughout the water column. Mobilization of arsenic as organo-arsenic complexes will not be likely given the low dissolved organic carbon content.

6.2 Arsenic Toxicity

The chemistry of arsenic in aquatic systems is unusually complex with oxidation-reduction, ligand exchange, precipitation, and adsorption reactions all taking place (Ferguson and Gavis 1972). Arsenic is stable in four oxidation states (+5, +3, 0 (metallic), and -3). Arsenic metal occurs only rarely. The -3 state is present in gaseous AsH_3 (arsine) which may form under some natural conditions. In aquatic environments the +3 and +5 valence states are common and occur in a variety of complex minerals and in dissolved salts.

Predictions of arsenic concentrations in the Betze Pit waterbody were made for total arsenic, irregardless of the oxidation state. Therefore, in order to make conservative estimates as to the potential toxicity of arsenic, it will be assumed that the all of the arsenic will be in the most toxic form, either trivalent (+3) or pentavalent (+5), depending upon whether acute or chronic endpoints are being assessed.

For inorganic trivalent arsenic, acute values for 16 freshwater animal species ranged from 812 µg/L for a cladoceran to 97,000 µg/L for a chironomid midge (USEPA 1986). Fish species were generally less sensitive than invertebrates, with acute values above 10,000 µg/L. Acute to chronic ratios (ACRs) for trivalent arsenic were low, ranging from 4.660 to 4.862. The USEPA acute and chronic criteria for trivalent arsenic in freshwater are 360 and 190 µg/L, respectively.

The available data for inorganic pentavalent arsenic indicate that the acute values cover about the same range as for trivalent arsenic. However, the ACR is much greater, with a single value of 28.71 for fathead minnow. Insufficient data are available to allow derivation of numerical water quality criteria for freshwater aquatic life for inorganic pentavalent arsenic. The LOEL (Lowest Observed Effect Level) for acute toxicity is 850 µg/L for a cladoceran (Bosmina) while the chronic LOEL is 48 µg/L for an aquatic plant.

The predicted arsenic concentration in the Betze Pit waterbody in the year 2100 is 40 µg/L; 60 µg/L at infinite time. However, surrounding each of these values is a wide confidence interval equaling roughly 3 times the value. The predicted values could actually range, therefore, from 13 to 120 and 23 to 180 µg/L. For the year 2100, the "mean" concentration of 40 µg/L is well below

the chronic criterion of 190 µg/L for trivalent arsenic and is even below the chronic LOEL for pentavalent arsenic. The maximum possible concentration of 120 µg/L is less than the trivalent chronic criterion, but is greater than then the pentavalent LOEL. The estimated mean arsenic concentration at infinite time is above the chronic LOEL for pentavalent arsenic; the maximum possible concentration is just below the trivalent chronic criterion.

Despite the fact that the predicted concentration may be greater than the chronic LOEL for pentavalent arsenic, it is doubtful that toxic conditions will result. The LOEL of 48 µg/L was derived using the alga Scenedesmus obliquus. Other algae, however, have tolerated concentrations much higher than 48 µg/L (e.g., an EC50 of 202,000 µg/L for the algal Chlamydomonas reinhardii). It is therefore possible that a chronic criterion for pentavalent arsenic will, when established, be greater than 48 µg/L. In addition, it is likely that some if not most of the arsenic will become unavailable to organisms by binding to other metals such as barium, chromium, and iron (Wagemann 1978). Organic materials can also make arsenic unavailable, although that route probably would not be significant in the oligotrophic Betze Pit waterbody.

Given the conditions described above, faunal toxicity as a result of arsenic in the filled Betze Pit is unlikely since the effect's levels for animals (particularly vertebrates) are much higher than for plants. It is possible that concentrations may be high enough to result in adverse effects on algae or some invertebrates. However, due to the possibility of loss of available arsenic as a result of complexion with metals and other substances, chronic toxicity on any organism is unlikely. The predicted arsenic concentrations are well below the acute criterion and LOEL for trivalent and pentavalent arsenic, respectively, making any acute toxicity even more improbable.

6.3 Bioconcentration

Accumulation of arsenic in organisms and subsequent transfer through trophic levels should not be a problem. This is due to a low bioconcentration factor (BCF) as well as rapid depuration rates (USEPA 1986). Spehar et al. (1980) reported BCFs for both trivalent and pentavalent arsenic of only 0 to 17 (the snail Helisoma campanulatum). BCFs for rainbow trout and bluegill were towards the low end of this range. Schuth et al. (1974) found that BCFs decreased with increasing trophic levels. Bioaccumulation of arsenic by consumers of all levels (e.g., waterfowl to raptors) should be of no concern.

6.4 Assessment of Potential Impact of Sorption on Arsenic Concentration

Sorption refers to the association between a soluble compound, in this case arsenic, and a solid surface. The term is generally

applied to a wide range of specific phenomenon including both absorption and adsorption reactions. These reactions are of interest because their net effect is to lower the concentration of free ion in solution. Thus, sorption has the potential to lower the concentration of arsenic in the pit waterbody. This section will examine that possibility.

6.4.1 Overview of Sorption Reactions

Under the well oxygenated conditions likely to exist in the pit waterbody, arsenic will be in its As^{5+} valence state. This occurs as H_3AsO_4 (arsenate) and its ions. Arsenate will sorb reasonably strongly to the surfaces of iron oxide and aluminum oxide solids (Livesey and Huang 1982; Jacobs et al. 1970). The sorption reaction is based, at least in part, on the charged nature of the arsenate ion. Therefore, other anions have the potential to compete with arsenate for the surface sites. Livesey and Huang (1981) note that phosphate does compete with arsenate while sulfate, nitrate, and chloride do not. Because iron oxides are likely to dominate in the pit water and walls, the following pair of reactions were considered:

$$H_3AsO_4 + \equiv FeOH \leftrightarrow \equiv FeH_2AsO_4 + H_2O \quad (1)$$

$$H_3PO_4 + \equiv FeOH \leftrightarrow \equiv FeH_2PO_4 + H_2O \quad (2)$$

It should be noted that the equations described above summarize the sorption of the species noted and all of the potential ions generated by proton dissociation. The pH reactions of the iron oxide surface (≡FeOH) were also considered.

6.4.2 The Sorption Model: MINTEQA2

The geochemical model employed in this analysis, MINTEQA2, is distributed and supported by the U.S. EPA Environmental Research Laboratory for Exposure Assessment Modeling (Brown and Allison 1987). In addition to the equilibrium speciation calculations performed by models such as WATEQ, MINTEQA2 allows the user to specify one of seven sorption models. Each sorption model requires a set of user-supplied inputs regarding the nature of the sorbent-sorbate interaction.

The sorption model selected is based on the work of Dzombak (Dzombak 1986; Dzombak and Morel 1987). The sorption equilibrium constants used in the analysis were also taken from Dzombak (1987).

6.4.3 Model Assumptions

As described above, sorption parameters were obtained from Dzombak (1987). In addition to the equilibrium constant (log K) for each reaction, these included typical parameters of amorphous iron

oxides such as specific surface area (200 m^2/g) and sorption site density (1.9×10^{-3} moles/g).

The composition of pit water solutions were taken from Tables 5-1 and 5-2 of this report. These two sets of data assume no reaction with wall rock and maximum possible reaction with wall rock, respectively. In both cases, the total arsenic concentration was 0.04 ppm in year 2100 and 0.06 ppm at steady state (over 200 years in the future).

As presented in Figures 6-2 and 6-3, four scenarios were examined:

- No Reaction with Wallrock, Predicted 2100 AD Conditions (pH = 8.3);
- No Reaction with Wallrock, Predicted Steady-state Conditions (pH = 8.48);
- Equilibrium with Wallrock, Predicted 2100 AD Conditions (pH = 7.56); and
- Equilibrium with Wallrock, Predicted Steady-state Conditions (pH = 7.57).

For all scenarios, the estimated iron oxide solid concentration is equal to the product of the average groundwater iron concentration (0.13 mg/l) and a typical concentration factor (2.0) minus the estimated dissolved iron concentration in the pit (0.1 mg/l). Thus, the estimated iron oxide concentration is 0.16 mg/l.

6.4.4 Results

For the two solution compositions, at the estimated iron oxide concentration of 0.16 mg/l, the proportion of sorbed arsenic to the total in solution was calculated using MINTEQA2. A number of trends are obvious in Figures 6-2 and 6-3. First, the proportion of sorbed arsenic increases with increasing iron oxide concentration. Overall, the relationship between sorbed arsenic proportion and iron oxide concentration has an characteristic "S" shape. Second, lower pH favors the sorption of arsenic to the iron oxide surface. This behavior is typical of anions such as arsenate.

Finally, Figures 6-2 and 6-3 suggest that sorption will not be an important sink for arsenic in the pit solution. Even at the estimated iron oxide concentration, less than 5 percent of total arsenic is sorbed. While the potential exists for iron oxides in the wall rock to present a sorbing surface, this is not likely to be a significant source for the following reasons:

- The volume of water in the pit suggests that, on average, water will have little contact with wall rock.

PROPORTION OF SORBED ARSENIC VERSUS IRON OXIDE CONCENTRATION
Curves are presented for estimated steady-state and 2100 AD conditions.
No reaction with wallrock is assumed.

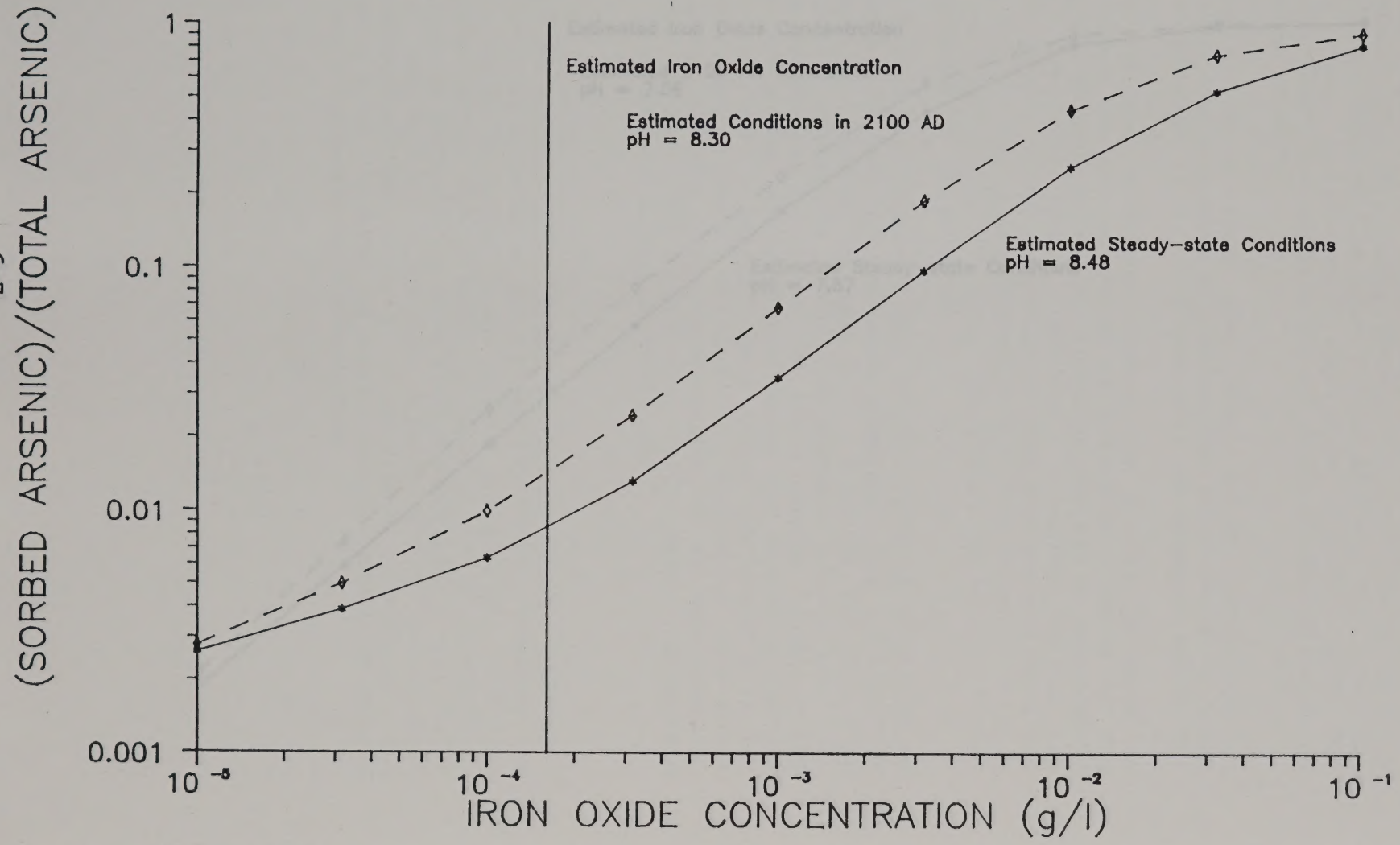
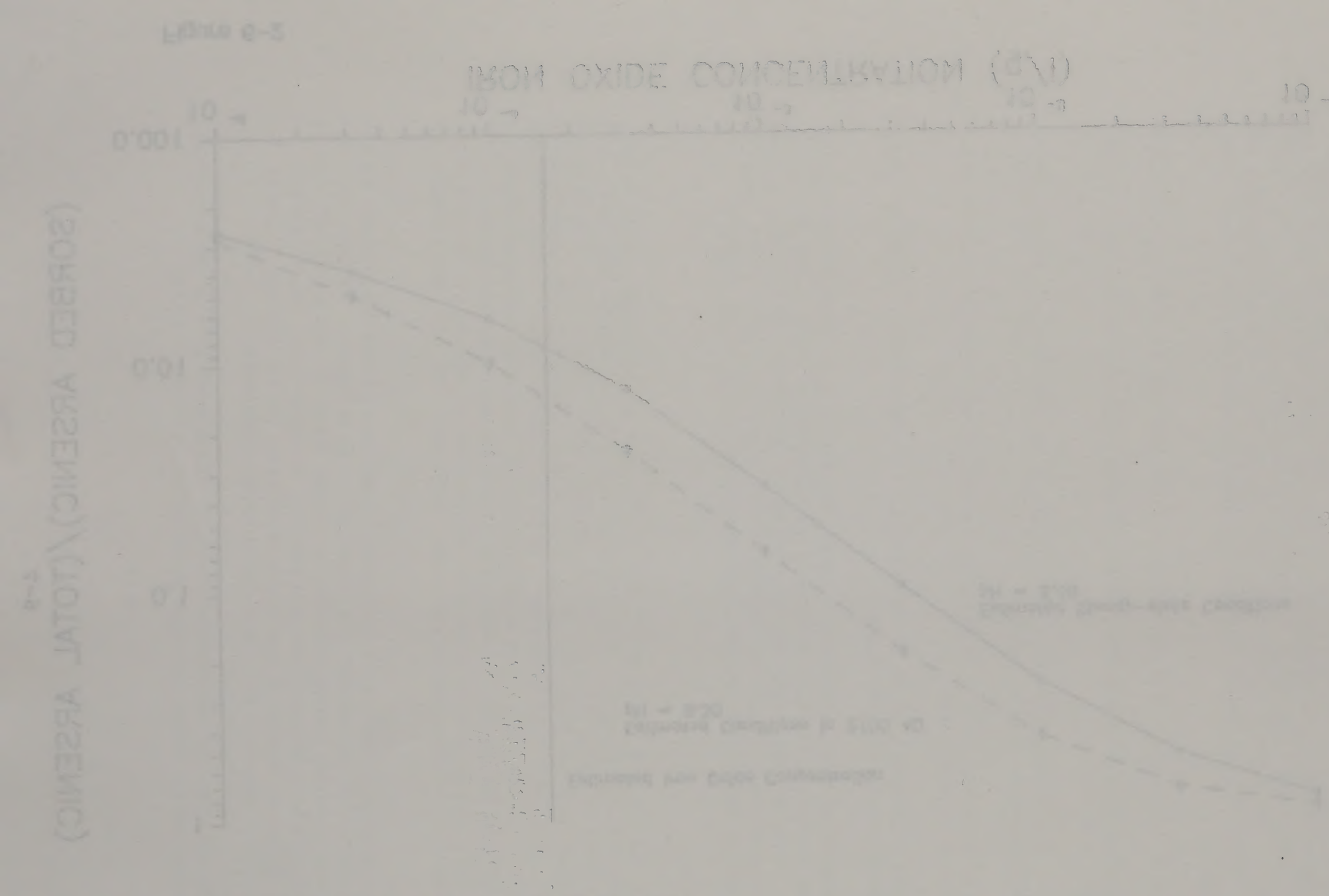


Figure 6-2



PROPORTION OF SORBED ARSENIC VERSUS IRON OXIDE CONCENTRATION
Curves are presented for estimated steady-state and 2100 AD conditions.
Equilibrium with wallrock is assumed.

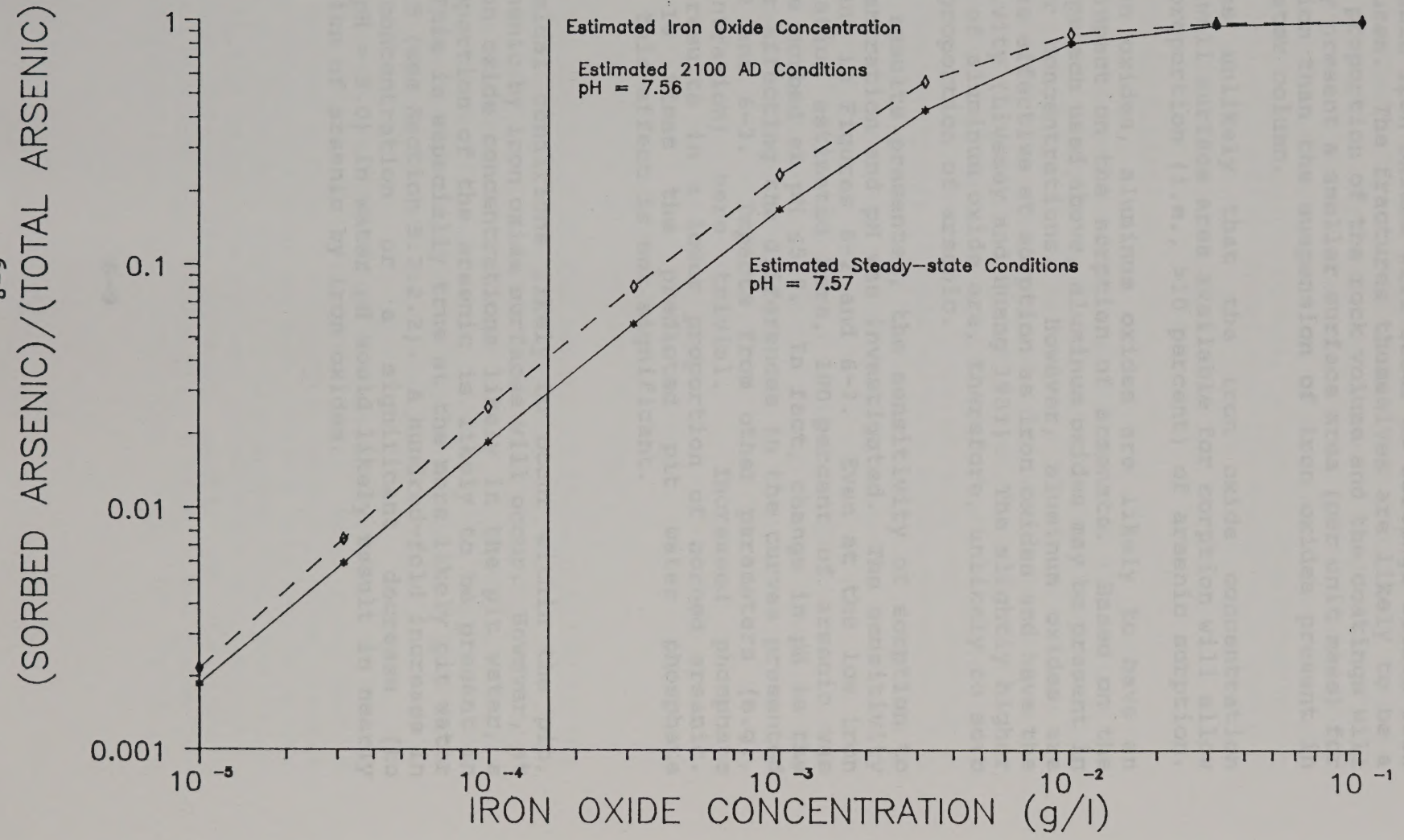
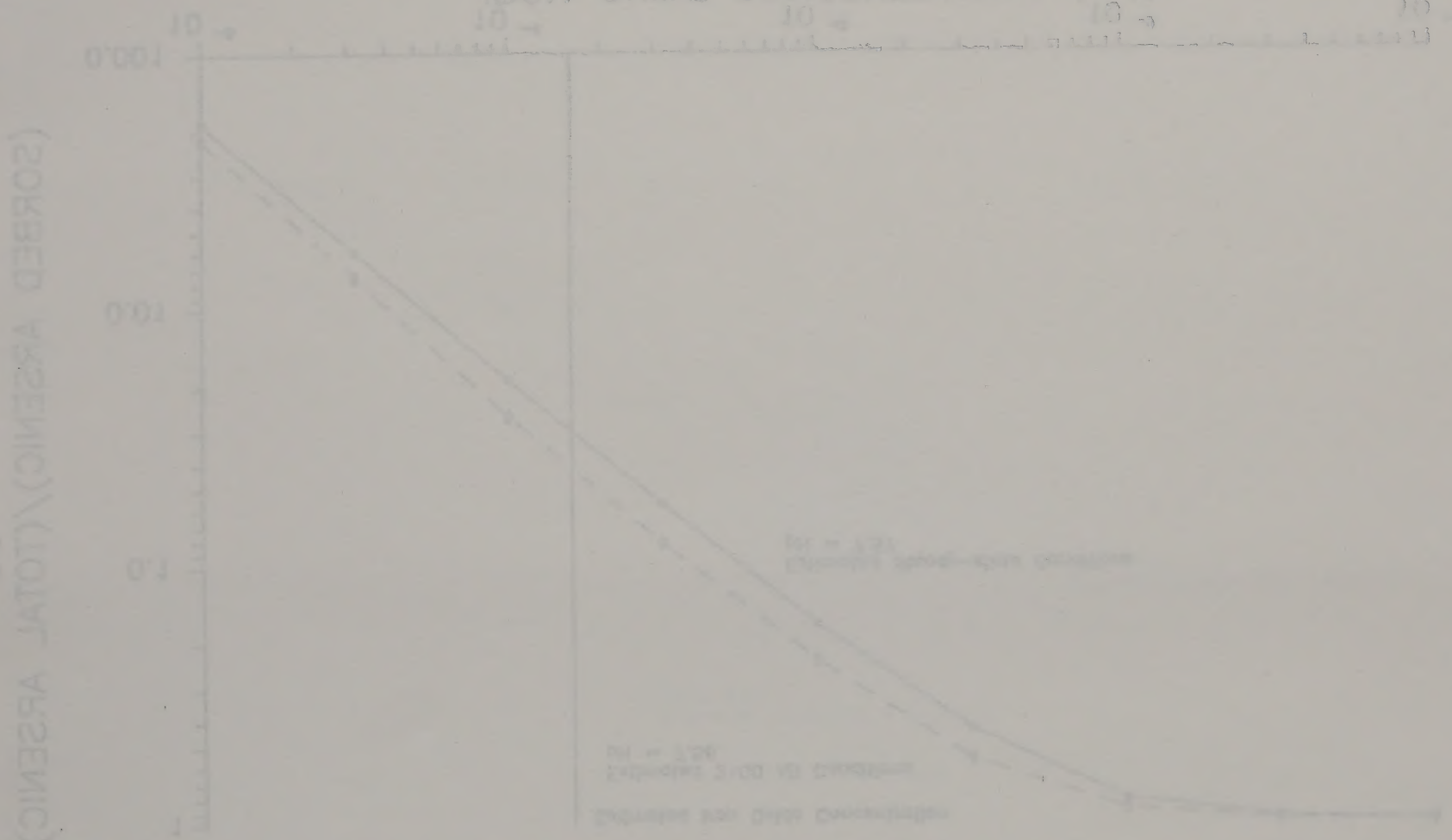


Figure 6-3



- A relatively small mass of the wall rock will consist of iron oxide surfaces. This is due to the fact that available iron oxides will occur as coatings within rock fractures. The fractures themselves are likely to be a small proportion of the rock volume and the coatings will likely present a smaller surface area (per unit mass) for sorption than the suspension of iron oxides present in the water column.

Thus, it seems unlikely that the iron oxide concentration represented by wall surface area available for sorption will allow a significant proportion (i.e., >10 percent) of arsenic sorption.

Similar to iron oxides, aluminum oxides are likely to have an insignificant impact on the sorption of arsenate. Based on the mass balance approach used above, aluminum oxides may be present in slightly higher concentrations. However, aluminum oxides are approximately as effective at sorption as iron oxides and have the same pH sensitivity (Livesey and Huang 1981). The slightly higher concentrations of aluminum oxide are, therefore, unlikely to sorb a significant proportion of arsenic.

In addition to results presented, the sensitivity of sorption to phosphate concentration and pH was investigated. The sensitivity to pH is evident in Figures 6-2 and 6-3. Even at the low iron oxide concentration estimated here, 100 percent of arsenic was predicted to be sorbed at pH ≤5.0. In fact, change in pH is the dominant factor affecting the differences in the curves presented in Figures 6-2 and 6-3. Impacts from other parameters (e.g., calcium concentration) were trivial. Increased phosphate concentration results in a lower proportion of sorbed arsenic. However, at 10 times the predicted pit water phosphate concentration, this effect is not significant.

6.4.5 Summary

Under the chemical conditions likely to occur within the pit, sorption of arsenic by iron oxide surfaces will occur. However, at the pH and iron oxide concentrations likely in the pit water, a very small proportion of the arsenic is likely to be present in sorbed form. This is especially true at the more likely pit water pH of 8.3 to 8.5 (see Section 5.2.2.2). A hundred-fold increase in iron oxide concentration or a significant decrease (to approximately pH = 5.0) in water pH would likely result in nearly complete sorption of arsenic by iron oxides.

7.0 CHARACTERIZATION OF BETZE PIT WATER

The biological productivity of the Betze Pit waterbody may be predicted based upon both physical and chemical estimates of the lake characteristics. Physical characteristics of waterbody area, shoreline length and depth are utilized in Section 7.1 to estimate littoral development and trophic status. Chemical characteristics in the form of nutrient loadings based upon the analysis in Section 5.0 are utilized in Section 7.2 to further refine estimates of trophic status and to estimate fish yield.

7.1 Physical Characterization

While freshwater lakes contain only approximately 0.009 percent of the total water in the biosphere, they provide an invaluable source of drinking and irrigation water as well as important recreation areas. Though lentic (including lakes and ponds) systems vary dramatically in their physical structure, chemical composition and biological productivity, some generalizations can be made about lakes, based upon lake structure. Using only the available physical data, statements may be made as to a lake's potential for productivity. Such statements, however, may be completely invalidated once chemical data on nutrient inputs are examined.

One measurement that is often used to estimate potential littoral development and subsequent macrophyte growth in a lake is the Shoreline Development Index (SDI). The SDI is calculated using the equation:

$$SDI = L/(2\sqrt{\pi A})$$

where:

L = Shoreline Length
A = Area of the Lake Surface

The SDI represents the ratio of the length of the shoreline to the circumference of a circle to an area equal to that of the lake (Wetzel 1983). A SDI of 1 would indicate a perfectly circular lake. Most lakes deviate considerably from 1. Generally, higher values indicate a dendritic lake with shallow areas that have the potential for littoral development. A good example of this type would be a river bottom flooded to create a reservoir.

An SDI was calculated for the Betze Pit waterbody at four different elevations over the filling time (Table 7-1). When full (beyond the year 2100) the SDI will be 1.2; earlier in the filling process the SDI will be slightly higher at 1.5. These very low SDIs are consistent with the estimated shoreline length when full (elevation = 5,300 feet); 16,608 feet. The maximum length (the uninterrupted straight distance between the farthest points on the lake's surface) of the waterbody will be roughly 1 mile. The shoreline length (circumference) of the waterbody will be equal to

TABLE 7-1

Estimates of Physical Parameters of the
Betze Pit During the Period of Filling

Elev.[1]	Approx. Year	Approx. Area (acres)	Approx. Area (sq.ft)	Approx. Volume (acre-ft)	Shore-line (ft)	Max. Depth (ft) (Zmax)	Mean Depth (ft) (Zmean)	Zmean/ Zmax	SDI[2]
4,520	2,010	71.85	3129786.0	18,000	9,408	380	250.5	0.66	1.5
4,700	2,017	110.00	4791600.0	38,000	11,592	560	345.5	0.62	1.5
5,000	2,042	244.03	10629946.8	98,000	13,992	860	401.6	0.47	1.2
5,300	>2,100	354.59	15445940.4	200,000	16,608	1,160	564.0	0.49	1.2

[1]Lowest point in the pit is 4,140 feet (elevation).

[2]Shoreline Development Index.

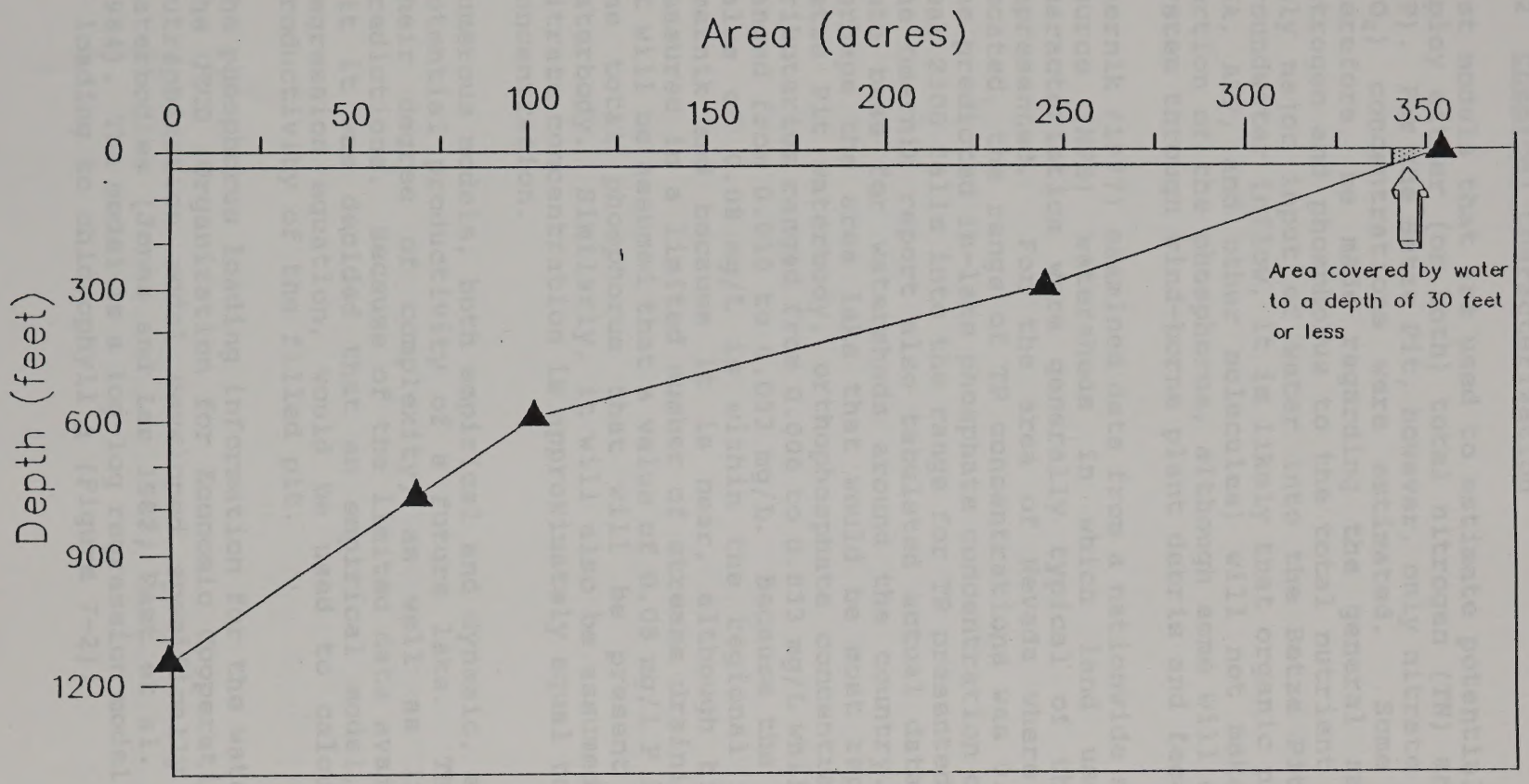
3.145 miles, which is just slightly more than pi (3.141). This waterbody will, therefore, closely resemble a circle with very few coves, bays, and other dendritic features.

Based solely upon the SDI, it might be anticipated that very little littoral development might take place around the perimeter of the future waterbody. Other measurements support this assumption. The hypsographic, or depth-area, curve is a graphical representation of the relationship between the surface area of the lake and its depth. A hypsographic curve of the Betze Pit (Figure 7-1) indicates that, in the filled waterbody, depth increases rapidly. Two factors which control the depth to which macrophytes can grow are light and hydrostatic pressure. It is not practical at this point to make any estimations of light penetration. Plants vary in their ability to withstand hydrostatic pressure. However, 10 m (roughly 30 feet) represents a reasonable maximum depth for macrophyte growth (Wetzel 1983). At this depth, which represents an increase in approximately 1 atmosphere of pressure, stems and roots are weaker and increased cellular permeability may lead to losses of nutrients and hormonal growth substances.

As can be seen from the hypsographic curve (Figure 7-1), the waterbody area that will be under 30 feet or less of water is small; approximately 19 acres in the filled waterbody. Since the slope of the pit walls generally does not become less acute with depth, this same area (19 acres), or less, should be representative of the potential littoral zone even as the pit is filling.

Another index of potential littoral development is the ratio of the mean depth (volume/area) to maximum depth. The lowest elevation in the pit will be 4,140 feet. Using this value, the maximum depth during filling will range from 380 feet to 1,160 feet, while the mean depth will increase from 250.5 feet to 564 feet (see Table 7-1). Estimated Zmean:Zmax ranges from 0.47 to 0.66; as the pit fills the ratio decreases, indicating the pit walls are somewhat less acute at the higher elevations. Most lakes have ratios ranging between 0.33 and 0.50 (Wetzel 1983). Values near or exceeding 0.50 are characteristic of caldera, graben or fjord lakes. The Betze Pit, therefore, will have relatively steep sides, a feature often associated with less productive natural lakes formed by volcanic or tectonic forces.

Based solely upon these limited physical data, the Betze Pit waterbody will resemble an oligotrophic system. It will be deep with steep slopes. The waterbody will be very round, similar to a caldera, and there will be little area for littoral development. Macrophytic growth will be minimal.



Estimated Hypsographic curve of Betze Pit
following complete filling

Figure 7-1

7.2 Chemical Characterization

Most models that are used to estimate potential lake productivity employ either (or both) total nitrogen (TN) and total phosphorus (TP). For the Betze Pit, however, only nitrate (NO_3) and phosphate (PO_4) concentrations were estimated. Some assumptions must, therefore, be made regarding the general ratios of inorganic nitrogen and phosphorus to the total nutrient levels. Since the only major input of water into the Betze Pit is assumed to be groundwater inflow, it is likely that organic phosphorus (e.g., in DNA, ATP, and other molecules) will not make up a significant portion of the phosphorus, although some will certainly enter the system through wind-borne plant debris and fecal material.

Omernik (1977) examined data from a nationwide set of 928 nonpoint-source (NPS) watersheds in which land uses and other NPS characteristics were generally typical of the areas that they represented. For the area of Nevada where the Betze Pit is located, the range of TP concentrations was 0.071 to 0.100 mg/L. The predicted in-lake phosphate concentration of 0.08 mg/L for the year 2100 falls into the range for TP presented by Omernik (1977). The Omernik report also tabulated actual data from EPA's STORET data base for watersheds around the country. For Lake Tahoe, perhaps the area lake that would be most representative of the Betze Pit waterbody, orthophosphate concentrations in watershed tributaries ranged from 0.006 to 0.033 mg/L while TP concentrations ranged from 0.010 to 0.053 mg/L. Because the predicted phosphate value of 0.08 mg/L is within the regional range suggested by Omernik and because it is near, although higher than, the TP measured in a limited number of streams draining into Lake Tahoe, it will be assumed that a value of 0.08 mg/l P is representative of the total phosphorus that will be present in the Betze Pit waterbody. Similarly, it will also be assumed that the predicted nitrate concentration is approximately equal to the total nitrogen concentration.

Numerous models, both empirical and dynamic, exist to predict the potential productivity of a future lake. These models vary in their degree of complexity, as well as in the accuracy of predictions. Because of the limited data available for the Betze Pit it was decided that an empirical model, in the form of a regression equation, would be used to calculate the potential productivity of the filled pit.

The phosphorus loading information for the waterbody was fitted to the OECD (Organization for Economic Cooperation and Development) eutrophication model developed specifically for United States waterbodies (Jones and Lee 1982; Rast et al. 1983; Lee and Jones 1984). The model is a log-log regression model relating normalized P loading to chlorophyll a (Figure 7-2):

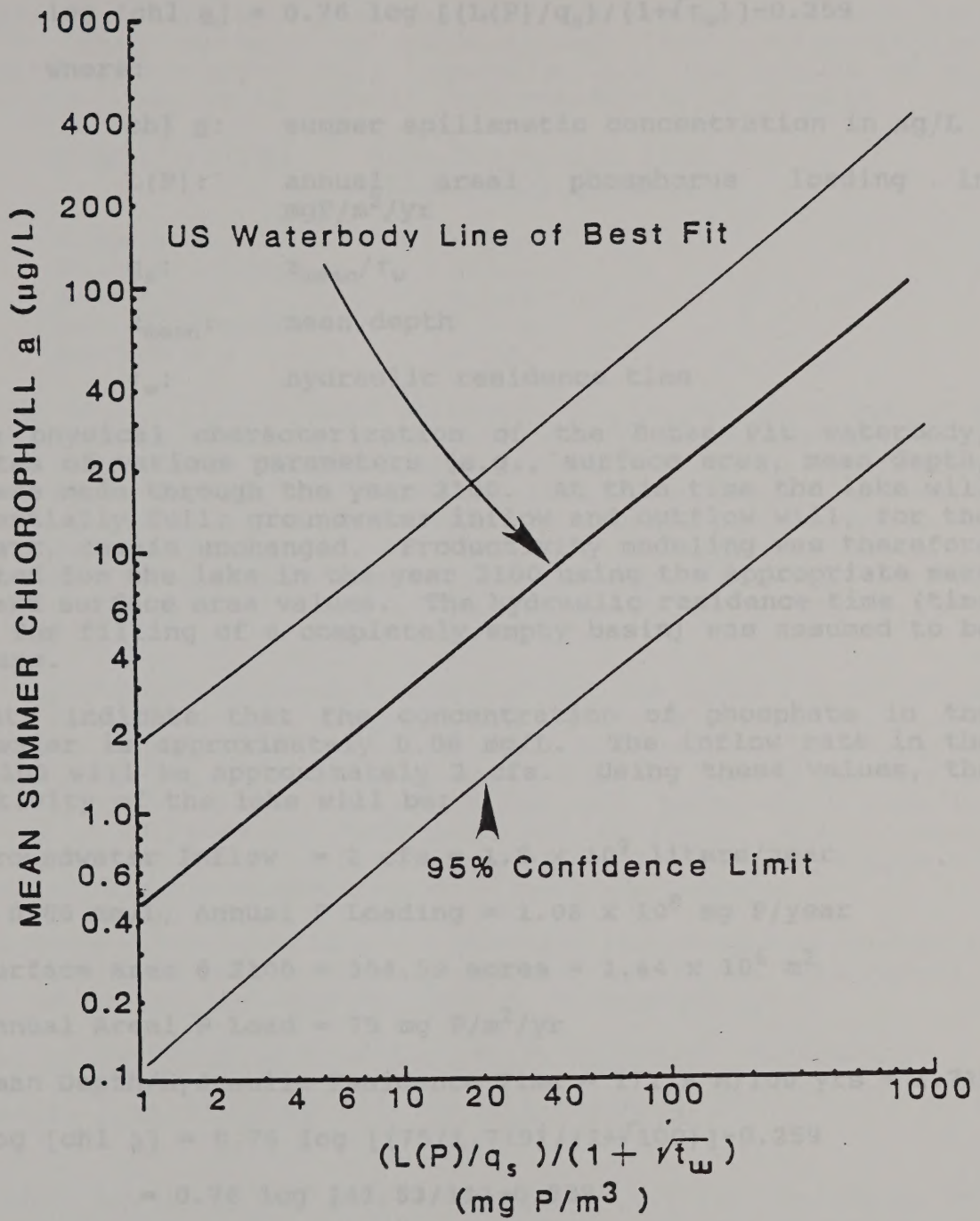
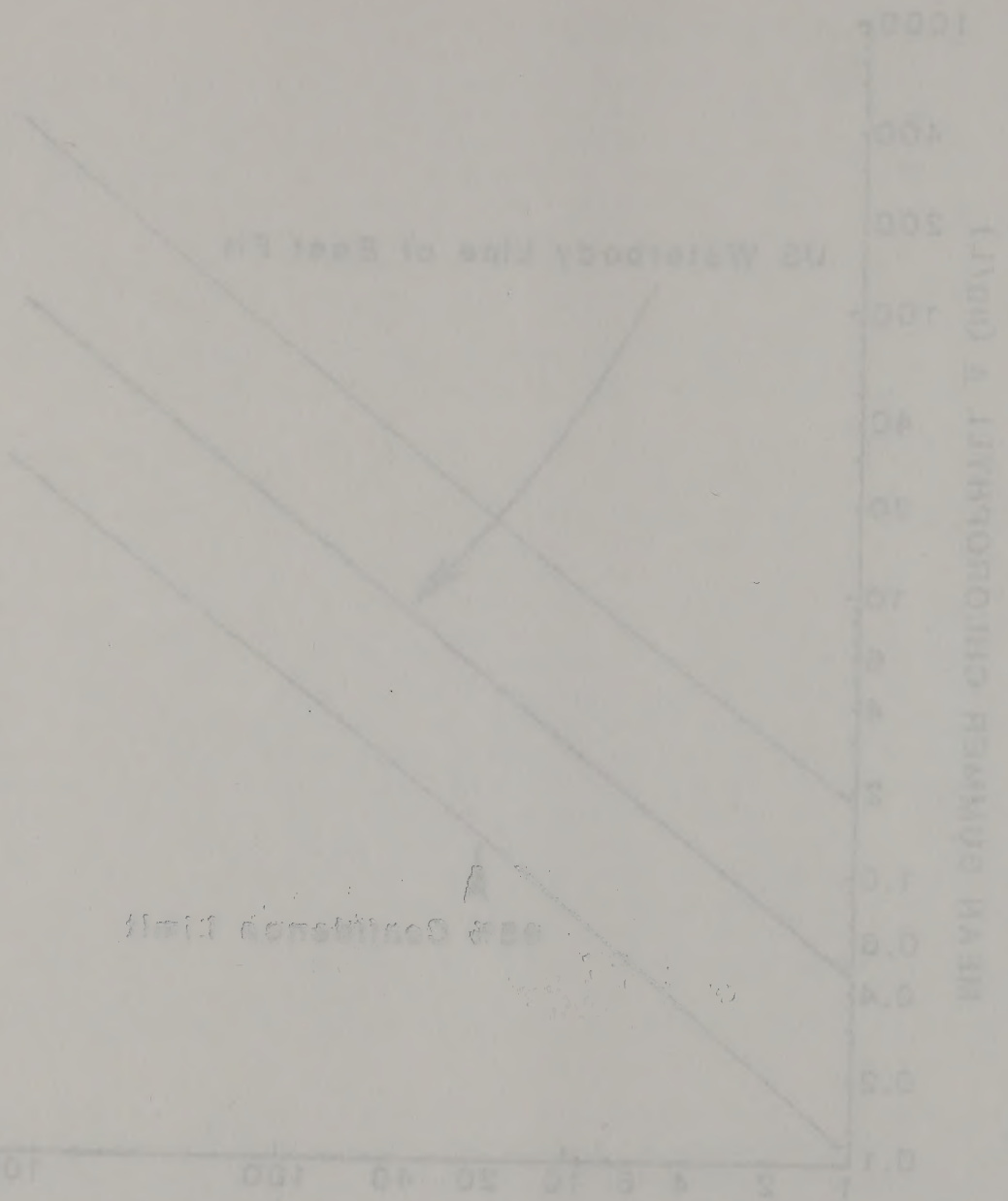


Figure 7-2. Phosphorus Load - Chlorophyll a Line-of-Best Fit for U.S. Waterbodies (After Jones and Lee 1982)



$$\log [\text{chl } \underline{a}] = 0.76 \log [(L(P)/q_s)/(1+\sqrt{\tau_w})]-0.259$$

where:

chl a: summer epilimnetic concentration in $\mu g/L$

L(P): annual areal phosphorus loading in $mgP/m^2/yr$

q_s: z_{mean}/τ_w

z_{mean}: mean depth

τ_w: hydraulic residence time

In the physical characterization of the Betze Pit waterbody, estimates of various parameters (e.g., surface area, mean depth, SDI) were made through the year 2100. At this time the lake will be essentially full; groundwater inflow and outflow will, for the most part, remain unchanged. Productivity modeling was therefore completed for the lake in the year 2100 using the appropriate mean depth and surface area values. The hydraulic residence time (time needed for filling of a completely empty basin) was assumed to be 100 years.

The data indicate that the concentration of phosphate in the groundwater is approximately 0.06 mg/L. The inflow rate in the year 2100 will be approximately 2 cfs. Using these values, the productivity of the lake will be:

Groundwater Inflow = 2 cfs = 1.8×10^9 liters/year

@ 0.06 mg/L, Annual P Loading = 1.08×10^8 mg P/year

Surface area @ 2100 = 354.59 acres = 1.44×10^6 m^2

Annual Areal P Load = 75 mg $P/m^2/yr$

Mean Depth/Hydraulic Residence Time = 171.9 m/100 yrs = 1.719

$$\log [\text{chl } \underline{a}] = 0.76 \log [(75/1.719)/(1+\sqrt{100})]-0.259$$

$$= 0.76 \log [43.63/11]-0.259$$

$$= 0.76 \log [3.967]-0.259$$

$$= 0.4548 - 0.259$$

$$= 0.196$$

chlorophyll a = 1.57 $\mu g/L$

The range of chlorophyll a values that are representative of lake types as they pertain to productivity (i.e., oligotrophic, mesotrophic, eutrophic) vary depending upon the source of the information. Lee et al. (1981) gave the following ranges:

Classification	Mean Planktonic Algal Chlorophyll a, μg/L
Oligotrophic	< 2.0
Oligo-Mesotrophic	2.1-2.9
Mesotrophic	3.0-6.9
Meso-Eutrophic	7.0-9.9
Eutrophic	≥ 10.0

Armstrong et al. (1987) found chlorophyll a to be a good indicator of trophic status with mean summer epilimnetic concentrations below 3 μg/L indicating oligotrophic conditions, 3-20 indicating mesotrophic conditions, and concentrations above 20 μg/L indicating eutrophic conditions. Although there is a discrepency between Lee et al. and Armstrong et al. in what is representative of mesotrophic or eutrophic waters, both sources indicate the the Betze Pit waterbody will be oligotrophic with low primary productivity.

A more qualitative approach to classifying the Betze Pit waterbody may be accomplished by plotting the estimated areal phosphorus loading (in grams/m^2/yr) against mean depth/hydraulic residence time (Figure 7-3). The resulting point on the graph may be compared to the lines of excessive and permissible loading suggested by Vollenweider (Archibald and Lee 1981). When plotted, the Betze Pit waterbody is positioned below the line of permissible loading, once again suggesting an oligotrophic system.

Lee and Jones (1979) extended the nutrient load-response concept to develop a relationship between P load and fish yield. The equation is similar to the one used to predict chlorophyll a:

$$\log [\text{Fish Yield}] = 0.70 \log [(L(P)/q_s)/(1+\sqrt{\tau_w})]-1.86$$

where: Fish Yield is in g wet weight/m^2/year

Using this equation the predicted fish yield for the Betze Pit waterbody will be 0.036 g/m^2/yr. Although no data are presented here to compare this value to other lakes, suffice it to say that 0.036 g is on the very low end of the data used in deriving the above equation. Secondary production, as represented by the fish community, should be quite low in the future waterbody. However, it is important to recognize that the mass of fish says nothing as to the quality of the fishery. Very eutrophic lakes may have high

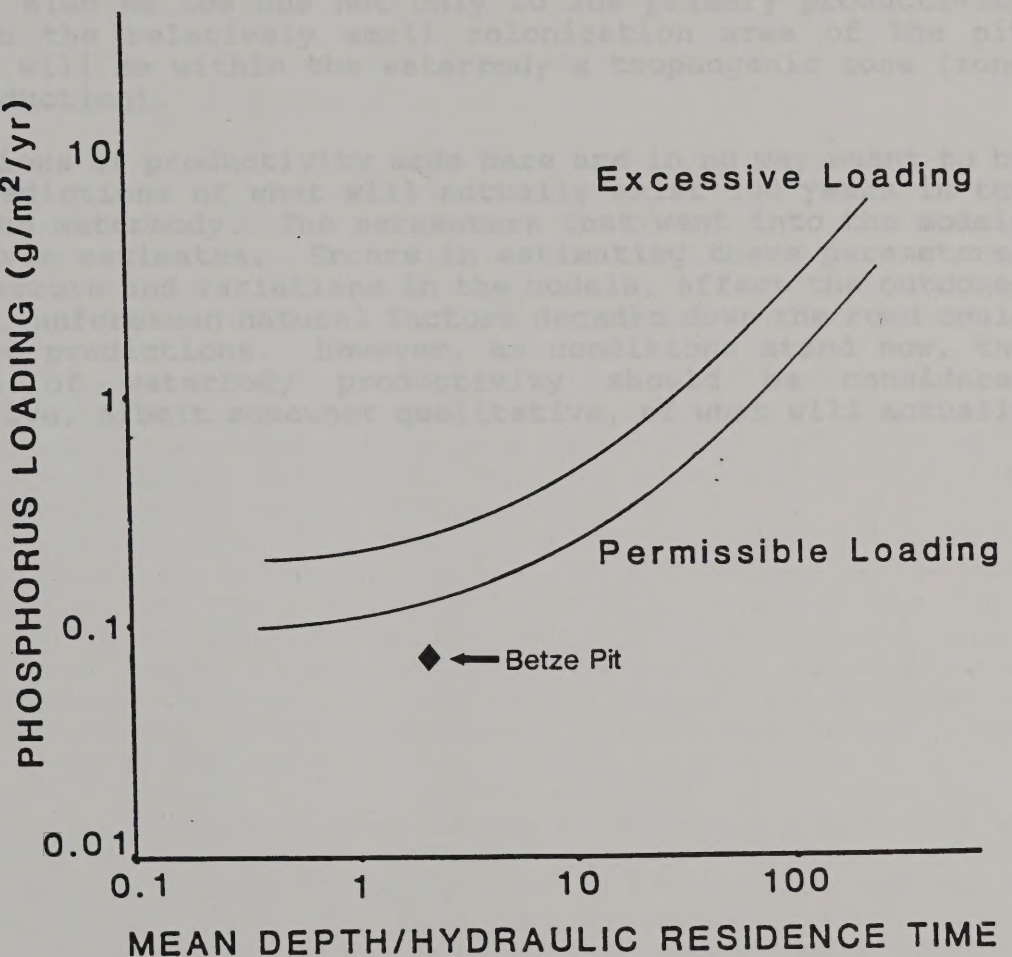
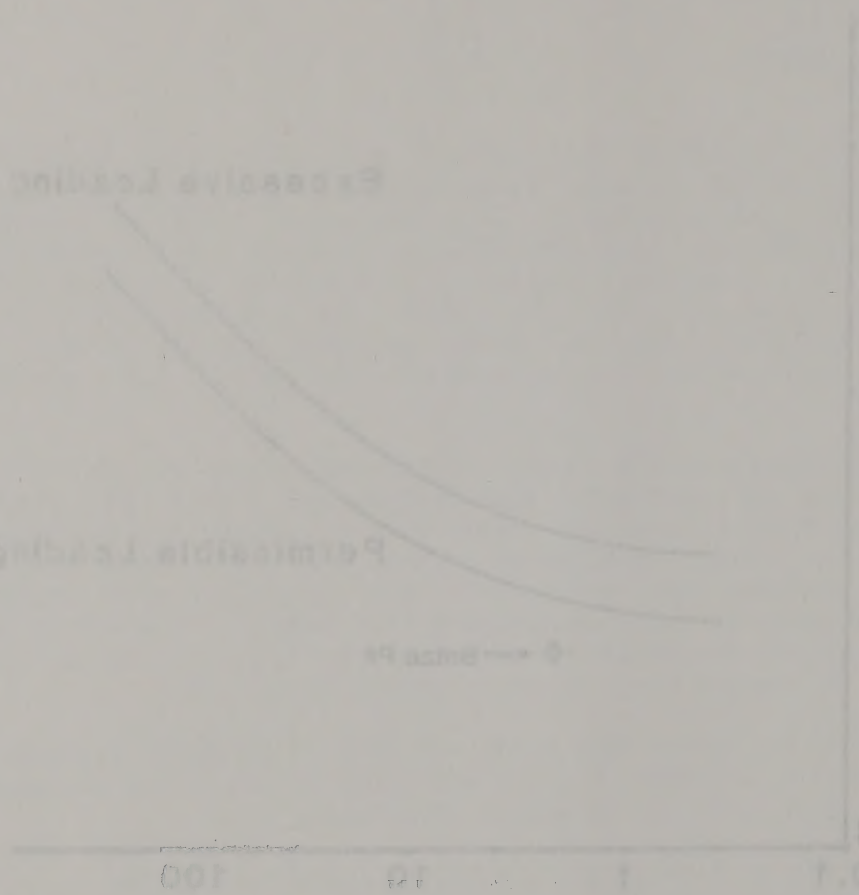


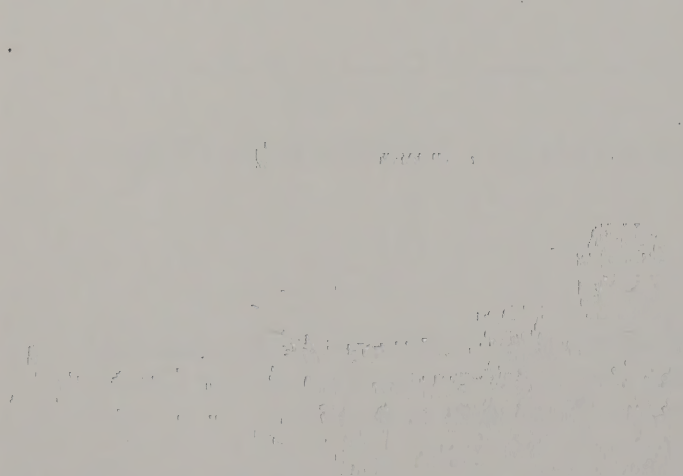
Figure 7-3. Betze Pit Data Applied to Vollenweider Phosphorus Loading - Mean Depth/Hydraulic Residence Time Relationship (After Rast and Lee 1978)



fish production, but it may be in the form of very small fish or large "trash" fish. In either case, a desirable fishery does not exist.

In conclusion, the analysis of both the predicted physical and chemical characteristics of the future Betze Pit waterbody indicate the waterbody will be oligotrophic in nature; that is, both primary and secondary production will be quite low. Although no attempt was made to estimate secondary production of benthic organisms, this should also be low due not only to low primary productivity but also to the relatively small colonization area of the pit bottom that will be within the waterbody's trophogenic zone (zone of food production).

The estimations of productivity made here are in no way meant to be accurate predictions of what will actually exist 100 years in the future in the waterbody. The parameters that went into the models are themselves estimates. Errors in estimating these parameters, as well as errors and variations in the models, affect the outcome. In addition, unforeseen natural factors decades down the road could affect these predictions. However, as conditions stand now, the estimations of waterbody productivity should be considered representative, albeit somewhat qualitative, of what will actually occur.



8.0 CYANIDE CHEMISTRY, TOXICITY, AND DEGRADATION

Dilute cyanide solutions are utilized at the Barrick Goldstrike Mine to leach gold from low-grade ore in a heap-leach facility and to dissolve gold from finely-ground ore slurry in the Carbon-in-Leach (CIL) processing component of the milling operation. Due to the presence of these solutions at the existing and proposed facilities, the following sections were included to describe the chemistry of cyanide, its toxicity, and degradation in the environment.

8.1 Forms of Cyanide and Toxicity

Cyanide occurs in several forms and its toxicity varies with the form in which it occurs. The following discussion is drawn from an EPA report (Engineering Science 1986) on the potential for effects of heap leach processes on the Black Hills of South Dakota. The discussion will briefly describe the forms of cyanide, their toxicities, and the degradation of cyanide in the environment.

Free cyanide includes both the cyanide ion (CN^-) and hydrogen cyanide (HCN) in solution. The relative concentrations of CN^- and HCN is dependent upon the pH of the solution, with HCN more abundant below a pH of about 9.4. HCN is also highly volatile depending upon solution concentration, temperature, and pH. Free cyanide is the most toxic form of cyanide and is lethal to aquatic organisms, vegetation, livestock, wildlife, and humans at varying threshold concentrations. In both plants and animals the main effect of cyanide is through inhibition of respiration and it is absorbed by the blood either through inhalation, ingestion or absorption through the skin. An analytical method is available to test for the presence of free cyanide and it is a method available to test for cyanide toxicity.

Simple cyanide is the combination of the cyanide ion (CN^-) with an alkali (sodium or potassium) or metal cation. Sodium cyanide (NaCN) is a simple cyanide commonly used in the process solutions for gold operations. The alkali cyanides in particular are soluble and readily release the cyanide ion which then would undergo hydrolysis to form the highly toxic and volatile hydrogen cyanide. The toxicity of the simple cyanides is dependent upon the ease with which the compounds dissolve or ionize to release free cyanide.

Complex cyanides are formed by the complexing of a heavy metal with the cyanide ion. The stability of complex cyanides varies with the metal to which the cyanide is bonded, with weak complexes formed with cadmium or zinc; moderate complexes formed with copper, nickel or silver; and strong complexes formed with iron, cobalt or gold. Complexes may dissociate to release free cyanide; however, the dissociation process may involve several steps, some of which may be rate limiting. The salts of metal cyanide complexes are

relatively insoluble. The toxicity of complex cyanide depends upon the rate at which dissociation into free cyanide occurs. Gold, iron, copper, and zinc cyanide complexes are examples of metal cyanide complexes found in process solutions at processing facilities. An analytical procedure known as weak acid dissociable cyanide (WAD) measures free cyanide and complexes of cadmium, copper, nickel, silver, and zinc.

8.2 Cyanide Toxicity

Cyanide is toxic to most forms of life above varying threshold concentrations. Free cyanide and hydrogen cyanide are readily absorbed by living tissue and interfere with the process of respiration. The cyanide ion reacts with the metal constituents of enzymes, especially cytochrome oxidase, inactivating the enzymes and preventing the utilization of oxygen by cells. Cells of the nervous system are particularly sensitive to reduced levels of oxygen, and therefore, death can result from the depression of the central nervous system.

Free cyanide is the most toxic form of cyanide. The toxicity of other forms of cyanide depends upon the ease with which free cyanide is liberated from the cyanide compound. Simple cyanides readily dissolve to release free cyanide into solution. Cyanide may complex with various metals with varying degrees of stability. These complexes are less toxic than free cyanide, especially the strong complexes with iron, cobalt, or gold. Thiocyanate is a breakdown product of cyanide which is passed through the human body without toxic effects.

Lethal levels of cyanide concentration varies for living organisms, mostly as a function of body weight. The lethal concentration for fish varies from about 25 ug/l to about 300 ug/l. Cyanide also has deleterious effects on fish reproduction and the growth and development of offspring. Toxic levels of cyanide for plants are not well documented. Reported concentrations that are lethal to various mammals include 3 mg/kg for mice, 0.1 mg/kg for birds, and 100 to 300 mg/l hydrogen cyanide vapor for humans. Ingestion of cyanide substances in the range of 50 to 200 mg is lethal to adult humans, and the lethal dose for absorption through the skin is 100 mg/kg body weight (Huiatt et al. 1983).

The EPA recommends a concentration not to exceed 0.2 mg/l for ambient water quality standards to protect humans from direct consumption of contaminants within the water or from fish within contaminated water. The concentration of sodium cyanide typically utilized at heap leach operations is 500 mg/l or an equivalent concentration of about 250 mg/l free cyanide. A well operated processing facility should pose little hazard to humans. The most likely result of an accidental release of cyanide solution would be the poisoning of aquatic species. Animal species that accidentally drink process solution will suffer severe effects, or death due to

the concentration of the solution. Animals that survive an acute cyanide poisoning recover rapidly due to natural detoxicification processes within the body that remove the contaminant from the body. Environmental effects of cyanide spills or leaks are limited in extent and time of contamination due to the rapid degradation of cyanide within the environment.

8.3 Degradation of Cyanide in the Environment

Cyanide is a highly reactive substance and is, therefore, a relatively short-lived contaminant in the environment. It is degraded or transformed by the processes of volatilization (of hydrogen cyanide), formation of ammonia and formate, oxidation, complexation with heavy metals, biological activity, conversion to thiocyanate (SCN^-) and sorption. Some iron cyanide complexes decompose in the presence of sunlight. Natural degradation through volatilization of hydrogen cyanide accounts for 90 percent of the decrease in cyanide concentration at mine sites in Canada (Simovic et al. 1985; Schmidt et al. 1981). Other processes are responsible for the degradation of lesser amounts of cyanide.

A number of artificial treatment methods are available for the destruction of cyanide in process solutions. Hydrogen peroxide is a treatment that can be utilized because the process does not add additional toxic by-products to the environment. Cyanide is oxidized by hydrogen peroxide to form cyanate, which is further hydrolyzed to form carbonate and ammonium. If copper is added to the solution then iron complexes may be precipitated in addition to the destruction of cyanide, hydrogen cyanide, and cyanide complexes with copper, zinc, and nickel.

9.0 SUMMARY AND CONCLUSIONS

The following conclusions have been reached as a result of an evaluation of the water resources impacts due to the proposed Betze Pit Expansion:

1. The acid neutralizing potential of the Betze Pit walls is roughly twice the acid generating potential, suggesting that the pit water will not become acidic.

2. Results of humidity cell tests suggest that significant amounts of arsenic are liberated from rock samples only when the pH of the leachate is less than approximately 5.0 s.u.

3. The most probable composition for the Betze Pit waterbody in the year 2100 is similar to that of present-day groundwater in the area. This water should meet drinking-water standards for all species, except perhaps arsenic, manganese, and possibly TDS and sulfate. The water should not be acidic.

4. The species of most concern is arsenic. Arsenic concentrations are relatively high in present-day groundwaters. Modeling with the MINTEQ computer code (see Section 6.4) indicates that arsenic would be strongly adsorbed by iron oxyhydroxides under the conditions present in the pit waterbody, but that the amount of ironoxyhydroxide present will probably be insufficient to have a major effect on arsenic concentrations. However, treatment of the lake with ferric sulfate could remove arsenic effectively from the water, should this ever become necessary in the future.

5. Conditions with the proposed Betze Pit waterbody would favor the predominance of the oxidized form of arsenic (As^{5+}) over the reduced form.

6. It is unlikely that predicted arsenic concentrations within the Betze Pit waterbody would be chronically toxic to either plants or animals. It is less likely that predicted arsenic concentrations will produce acute toxicity.

7. Given the conditions likely to occur in the proposed Betze Pit waterbody, the sorption of arsenic by iron oxide will occur; however, iron oxide will not occur in sufficient quantity to significantly reduce arsenic concentrations.

8. The Betze Pit will resemble a caldera upon completion of mining, forming a waterbody with little area for littoral development.

9. Physical characterization of the pit waterbody suggests that the waterbody will be oligotrophic, with low biological productivity.

10. A well operated processing facility utilizing cyanide solutions should pose little hazard to humans. The most likely result of an accidental release of cyanide solution is the poisoning of aquatic species. Effects of cyanide spills or leaks are limited in extent and time of contamination due to the relatively rapid degradation of cyanide within the environment.

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APPENDIX A

WHOLE ROCK CHEMICAL ANALYSIS RESULTS

A-1 - Core Labs Report #900318

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CORE LABORATORIES

ANALYTICAL REPORT

900318

FOR

ENSR CONSULTING & ENGINEERING

1716 HEATH PARKWAY
FORT COLLINS, CO 80524

04/12/90

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LABORATORY TESTS RESULTS
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JOB NUMBER: 900318 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 1 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-1 REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-2 REM:

SAMPLE NUMBER: 3 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-3 REM:

SAMPLE NUMBER: 4 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-4 REM:

SAMPLE NUMBER: 5 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-5 REM:

SAMPLE NUMBER: 6 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-6 REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	UNITS OF MEASURE
Total Sulfur (as S)	<0.01	1.45	<0.01	1.69	0.42	0.72	%
Pyritic Sulfur (as S)	0.12	1.23	0.01	1.49	0.26	0.65	%
Sulfate Sulfur (%)	<0.01	0.09	<0.01	0.08	<0.01	0.02	%
APP/Peroxide (as S)	<0.01	1.28	<0.01	1.39	0.23	0.48	%
Total Sulfur (Tons CaCO3/Kt)	<0.3	45.3	<0.3	52.8	13.1	22.5	Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	3.8	38.4	0.3	46.6	8.1	20.3	Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	<0.1	40.0	<0.1	43.4	7.2	15.0	Tons CaCO3/Kt
Acid Neutralizing Potential	61.3	<0.1	63.0	0.2	52.3	221	Tons CaCO3/Kt
Arsenic, Total (As)	39	1790	24	674	44	158	mg/Kg
Barium, Total (Ba)	227	515	197	1490	430	306	mg/Kg
Boron, Total (B)	<10	<10	<10	<10	<10	<10	mg/Kg
Cadmium, Total (Cd)	<0.5	4.8	<0.5	<0.5	<0.5	<0.5	mg/Kg

APPROVED BY: Linda I. Barbera

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SAMPLE NUMBER: 1 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-1 REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-2 REM:

SAMPLE NUMBER: 3 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-3 REM:

SAMPLE NUMBER: 4 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-4 REM:

SAMPLE NUMBER: 5 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-5 REM:

SAMPLE NUMBER: 6 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-6 REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	UNITS OF MEASURE
Chromium, Total (Cr)	40	56	68	34	65	22	mg/Kg
Copper, Total (Cu)	40	66	30	34	9	23	mg/Kg
Iron, Total (Fe)	26100	25600	29500	23200	35800	16600	mg/Kg
Lead, Total (Pb)	14	14	6	26	7	<5	mg/Kg
Mercury, Total (Hg)	<0.15	10.6	<0.15	5.47	<0.15	0.77	mg/Kg
Magnesium, Total (Mg)	3680	427	15500	385	19500	8380	mg/Kg
Manganese, Total (Mn)	346	96	306	65	561	288	mg/Kg
Nickel, Total (Ni)	32	127	36	83	14	34	mg/Kg
Selenium, Total (Se)	<10	<10	<10	<10	<10	<10	mg/Kg
Silver, Total (Ag)	<1	2	<2	<2	<2	<1	mg/Kg
Thallium, Total (Tl)	<20	<20	<20	<20	40	<20	mg/Kg

APPROVED BY: Linda T. Burbick

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SAMPLE NUMBER: 7 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-7 REM:

SAMPLE NUMBER: 8 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-8 REM:

SAMPLE NUMBER: 9 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-9 REM:

SAMPLE NUMBER: 10 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-10 REM:

SAMPLE NUMBER: 11 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-11 REM:

SAMPLE NUMBER: 12 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-12 REM:

TEST DESCRIPTION	SAMPLE 7	SAMPLE 8	SAMPLE 9	SAMPLE 10	SAMPLE 11	SAMPLE 12	UNITS OF MEASURE
Total Sulfur (as S)	1.59	1.25	0.02	0.01	0.01	0.16	%
Pyritic Sulfur (as S)	1.30	0.89	0.01	<0.01	0.01	0.13	%
Sulfate Sulfur (%)	0.01	0.11	0.02	<0.01	0.01	<0.01	%
APP/Peroxide (as S)	1.39	0.67	<0.01	<0.01	<0.01	0.10	%
Total Sulfur (Tons CaCO3/Kt)	49.7	39.1	0.6	0.3	0.3	5.0	Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	40.6	27.8	0.3	<0.3	0.3	4.1	Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	43.4	20.9	<0.1	<0.1	<0.1	3.1	Tons CaCO3/Kt
Acid Neutralizing Potential	107	<0.1	3.2	6.4	2.4	163	Tons CaCO3/Kt
Arsenic, Total (As)	727	835	88	1500	1260	10	mg/Kg
Barium, Total (Ba)	247	224	197	283	374	242	mg/Kg
Boron, Total (B)	<10	<10	<10	<10	<10	<10	mg/Kg
Cadmium, Total (Cd)	<0.5	2.7	<0.5	13.5	16.0	<0.5	mg/Kg

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SAMPLE NUMBER: 7 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-7 REM:

SAMPLE NUMBER: 8 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-8 REM:

SAMPLE NUMBER: 9 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-9 REM:

SAMPLE NUMBER: 10 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-10 REM:

SAMPLE NUMBER: 11 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-11 REM:

SAMPLE NUMBER: 12 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00
PROJECT: 0739-001-203 SAMPLE: WR-12 REM:

TEST DESCRIPTION	SAMPLE 7	SAMPLE 8	SAMPLE 9	SAMPLE 10	SAMPLE 11	SAMPLE 12	UNITS OF MEASURE
Chromium, Total (Cr)	37	58	30	29	31	76	mg/Kg
Copper, Total (Cu)	20	69	110	44	44	76	mg/Kg
Iron, Total (Fe)	42200	29800	9440	19500	18400	32700	mg/Kg
Lead, Total (Pb)	49	11	34	9	13	<5	mg/Kg
Mercury, Total (Hg)	0.34	18.8	2.74	4.74	4.72	<0.15	mg/Kg
Magnesium, Total (Mg)	17700	478	357	401	387	19200	mg/Kg
Manganese, Total (Mn)	612	116	40	41	41	461	mg/Kg
Nickel, Total (Ni)	11	250	10	32	35	44	mg/Kg
Selenium, Total (Se)	<10	<10	<10	<10	<10	<10	mg/Kg
Silver, Total (Ag)	<1	2	1	<2	<2	<2	mg/Kg
Thallium, Total (Tl)	<20	<20	<20	<20	<20	<20	mg/Kg

APPROVED BY: Linda L. Benbow

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JOB NUMBER: 900318 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 13 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00

PROJECT: 0739-001-203 SAMPLE: WR-13 REM:

TEST DESCRIPTION	SAMPLE 13						UNITS OF MEASURE
Total Sulfur (as S)	1.92						%
Pyritic Sulfur (as S)	1.22						%
Sulfate Sulfur (%)	0.06						%
APP/Peroxide (as S)	1.21						%
Total Sulfur (Tons CaCO3/Kt)	60.0						Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	38.1						Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	37.8						Tons CaCO3/Kt
Acid Neutralizing Potential	7.2						Tons CaCO3/Kt
Arsenic, Total (As)	223						mg/Kg
Barium, Total (Ba)	130						mg/Kg
Boron, Total (B)	<10						mg/Kg
Cadmium, Total (Cd)	<0.5						mg/Kg

APPROVED BY: Linda L. Burkus

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JOB NUMBER: 900318 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 13 DATE RECEIVED: 03/13/90 TIME RECEIVED: 10:50 SAMPLE DATE: 03/12/90 SAMPLE TIME: 17:00

PROJECT: 0739-001-203 SAMPLE: WR-13 REM:

TEST DESCRIPTION	SAMPLE 13	UNITS OF MEASURE
Chromium, Total (Cr)	25	mg/Kg
Copper, Total (Cu)	27	mg/Kg
Iron, Total (Fe)	24400	mg/Kg
Lead, Total (Pb)	15	mg/Kg
Mercury, Total (Hg)	1.59	mg/Kg
Magnesium, Total (Mg)	1250	mg/Kg
Manganese, Total (Mn)	224	mg/Kg
Nickel, Total (Ni)	34	mg/Kg
Selenium, Total (Se)	<10	mg/Kg
Silver, Total (Ag)	<2	mg/Kg
Thallium, Total (Tl)	<20	mg/Kg

APPROVED BY: Linda L. Burkes

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A-2 - Core Labs Report #900804

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

ANALYTICAL REPORT

900804

FOR

ENSR CONSULTING & ENGINEERING

1716 HEATH PARKWAY
FORT COLLINS, CO 80524

07/30/90

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CORE LABORATORIES

LABORATORY TESTS RESULTS
07/30/90

JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 1 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-1 REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-2 REM:

SAMPLE NUMBER: 3 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-3 REM:

SAMPLE NUMBER: 4 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-5 REM:

SAMPLE NUMBER: 5 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-6 REM:

SAMPLE NUMBER: 6 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-8 REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	UNITS OF MEASURE
Total Sulfur (as S)	0.17	0.17	0.60	0.42	2.21	1.16	%
Pyritic Sulfur (as S)	0.06	0.02	0.69	0.24	1.99	0.93	%
Sulfur, Unidentified (as S)	0.07	<0.01	<0.01	0.04	0.02	0.12	%
Sulfate Sulfur (%)	0.04	0.17	0.05	0.14	0.20	0.14	%
APP/Peroxide (as S)	<0.01	<0.01	0.31	0.01	1.03	0.33	%
Total Sulfur (Tons CaCO3/Kt)	5.3	5.3	18.8	13.1	69.1	36.2	Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	1.9	0.6	21.6	7.5	62.2	29.1	Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	<0.1	<0.1	9.7	0.3	32.3	10.3	Tons CaCO3/Kt
Acid Neutralizing Potential	1.8	2.0	7.2	0.1	8.0	1.5	Tons CaCO3/Kt
Arsenic, Total (As)	596	292	586	1450	1950	1440	mg/Kg
Barium, Total (Ba)	92	156	774	287	165	404	mg/Kg
Boron, Total (B)	<5	<5	<5	<5	<5	<5	mg/Kg

APPROVED BY: David McWhorter

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CORE LABORATORIES

LABORATORY TESTS RESULTS
07/30/90

JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 1 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-1 REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-2 REM:

SAMPLE NUMBER: 3 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-3 REM:

SAMPLE NUMBER: 4 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-5 REM:

SAMPLE NUMBER: 5 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-6 REM:

SAMPLE NUMBER: 6 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-8 REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6	UNITS OF MEASURE
Cadmium, Total (Cd)	3	<1	3	<1	5	1	mg/Kg
Chromium, Total (Cr)	15	11	12	6	10	11	mg/Kg
Copper, Total (Cu)	39	42	90	92	56	29	mg/Kg
Iron, Total (Fe)	9690	13200	23300	18500	30700	15600	mg/Kg
Lead, Total (Pb)	20	85	16	7	14	27	mg/Kg
Mercury, Total (Hg)	4.00	1.72	2.91	3.00	6.40	1.80	mg/Kg
Magnesium, Total (Mg)	107	434	1600	165	4100	286	mg/Kg
Manganese, Total (Mn)	10	43	81	260	176	9	mg/Kg
Nickel, Total (Ni)	51	4	96	24	118	73	mg/Kg
Selenium, Total (Se)	<10	<10	10	<10	<10	<10	mg/Kg
Silver, Total (Ag)	<1	<1	<1	<1	<1	<1	mg/Kg
Thallium, Total (Tl)	<20	<20	<20	<20	<20	<20	mg/Kg

APPROVED BY: David McWhorter

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CORE LABORATORIES

LABORATORY TESTS RESULTS
07/30/90

JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 7 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-9 REM:

SAMPLE NUMBER: 8 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-10 REM:

SAMPLE NUMBER: 9 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-11 REM:

SAMPLE NUMBER: 10 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-12 REM:

SAMPLE NUMBER: 11 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-13 REM:

SAMPLE NUMBER: 12 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-14 REM:

TEST DESCRIPTION	SAMPLE 7	SAMPLE 8	SAMPLE 9	SAMPLE 10	SAMPLE 11	SAMPLE 12	UNITS OF MEASURE
Total Sulfur (as S)	0.99	4.52	0.23	0.30	2.86	1.38	%
Pyritic Sulfur (as S)	0.46	3.70	0.41	0.49	1.68	0.83	%
Sulfur, Unidentified (as S)	0.52	0.72	<0.01	<0.01	1.10	0.52	%
Sulfate Sulfur (%)	0.01	0.10	<0.01	0.01	0.08	0.03	%
APP/Peroxide (as S)	0.93	3.16	0.04	<0.01	1.13	0.39	%
Total Sulfur (Tons CaCO3/Kt)	30.9	141	7.2	9.4	89.4	43.1	Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	14.4	116	12.8	15.3	52.5	25.9	Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	29.1	98.8	1.2	<0.1	35.3	12.2	Tons CaCO3/Kt
Acid Neutralizing Potential	7.2	48.3	107	125	75.1	42.4	Tons CaCO3/Kt
Arsenic, Total (As)	442	4790	697	706	5080	1450	mg/Kg
Barium, Total (Ba)	462	46	283	269	223	147	mg/Kg
Boron, Total (B)	<5	<5	<5	<5	<5	<5	mg/Kg

APPROVED BY: David McWhorter

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CORE LABORATORIES

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07/30/90

JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 7 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-9 REM:

SAMPLE NUMBER: 8 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-10 REM:

SAMPLE NUMBER: 9 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-11 REM:

SAMPLE NUMBER: 10 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-12 REM:

SAMPLE NUMBER: 11 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-13 REM:

SAMPLE NUMBER: 12 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-14 REM:

TEST DESCRIPTION	SAMPLE 7	SAMPLE 8	SAMPLE 9	SAMPLE 10	SAMPLE 11	SAMPLE 12	UNITS OF MEASURE
Cadmium, Total (Cd)	4	<1	<1	<1	<1	<1	mg/Kg
Chromium, Total (Cr)	17	29	32	26	15	8	mg/Kg
Copper, Total (Cu)	33	73	11	12	39	20	mg/Kg
Iron, Total (Fe)	12000	47500	33100	34600	26100	30600	mg/Kg
Lead, Total (Pb)	45	11	<5	5	14	13	mg/Kg
Mercury, Total (Hg)	1.37	7.40	<0.15	<0.15	52.2	19.2	mg/Kg
Magnesium, Total (Mg)	437	6790	16600	17100	4770	2970	mg/Kg
Manganese, Total (Mn)	13	497	539	541	195	168	mg/Kg
Nickel, Total (Ni)	79	77	17	7	103	26	mg/Kg
Selenium, Total (Se)	10	<10	<10	<10	<10	<10	mg/Kg
Silver, Total (Ag)	<1	<1	<1	<1	<1	<1	mg/Kg
Thallium, Total (Tl)	<20	<20	<20	<20	40	40	mg/Kg

APPROVED BY: David McWhorter

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CORE LABORATORIES

LABORATORY TESTS RESULTS
07/30/90

JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 13 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-15 REM:

SAMPLE NUMBER: 14 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-1P REM:

SAMPLE NUMBER: 15 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-2P REM:

SAMPLE NUMBER: 16 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-3P REM:

SAMPLE NUMBER: 17 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-4P REM:

SAMPLE NUMBER: 18 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-5P REM:

TEST DESCRIPTION	SAMPLE 13	SAMPLE 14	SAMPLE 15	SAMPLE 16	SAMPLE 17	SAMPLE 18	UNITS OF MEASURE
Total Sulfur (as S)	2.17	<0.01	1.01	<0.01	4.35	1.20	%
Pyritic Sulfur (as S)	1.46	0.05	0.62	0.02	3.54	0.96	%
Sulfur, Unidentified (as S)	0.54	<0.01	0.37	<0.01	0.75	0.25	%
Sulfate Sulfur (%)	0.17	<0.01	0.02	<0.01	0.06	<0.01	%
APP/Peroxide (as S)	1.30	<0.01	0.16	<0.01	2.89	0.42	%
Total Sulfur (Tons CaCO3/Kt)	67.8	<0.3	31.6	<0.3	136	37.8	Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	45.6	1.6	19.4	0.6	111	30.0	Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	40.6	<0.1	5.00	<0.1	90.3	18.8	Tons CaCO3/Kt
Acid Neutralizing Potential	8.5	46.4	3.8	40.0	0.4	171	Tons CaCO3/Kt
Arsenic, Total (As)	2250	442	845	60	4700	1910	mg/Kg
Barium, Total (Ba)	145	169	150	119	120	255	mg/Kg
Boron, Total (B)	<5	<5	<5	<5	7	<5	mg/Kg

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SAMPLE NUMBER: 13 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: B-15 REM:

SAMPLE NUMBER: 14 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-1P REM:

SAMPLE NUMBER: 15 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-2P REM:

SAMPLE NUMBER: 16 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-3P REM:

SAMPLE NUMBER: 17 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-4P REM:

SAMPLE NUMBER: 18 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-5P REM:

TEST DESCRIPTION	SAMPLE 13	SAMPLE 14	SAMPLE 15	SAMPLE 16	SAMPLE 17	SAMPLE 18	UNITS OF MEASURE
Cadmium, Total (Cd)	4	<1	3	<1	5	<1	mg/Kg
Chromium, Total (Cr)	9	19	84	42	3	46	mg/Kg
Copper, Total (Cu)	62	26	56	60	24	14	mg/Kg
Iron, Total (Fe)	30600	19800	16700	27600	46800	36500	mg/Kg
Lead, Total (Pb)	8	30	8	<5	36	10	mg/Kg
Mercury, Total (Hg)	8.00	0.23	2.04	0.18	2.19	<0.15	mg/Kg
Magnesium, Total (Mg)	3530	4440	485	12000	285	14500	mg/Kg
Manganese, Total (Mn)	160	545	78	275	12	776	mg/Kg
Nickel, Total (Ni)	118	28	114	26	42	22	mg/Kg
Selenium, Total (Se)	<10	<10	10	<10	10	<10	mg/Kg
Silver, Total (Ag)	<1	<1	<1	<1	<2	<1	mg/Kg
Thallium, Total (Tl)	<20	<20	<20	<20	30	40	mg/Kg

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LABORATORY TESTS RESULTS
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JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 19 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-6P REM:

SAMPLE NUMBER: 20 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-7P REM:

SAMPLE NUMBER: 21 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-8P REM:

SAMPLE NUMBER: 22 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-9P REM:

SAMPLE NUMBER: 23 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-10P REM:

SAMPLE NUMBER: 24 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-11P REM:

TEST DESCRIPTION	SAMPLE 19	SAMPLE 20	SAMPLE 21	SAMPLE 22	SAMPLE 23	SAMPLE 24	UNITS OF MEASURE
Total Sulfur (as S)	1.40	1.61	2.15	0.02	<0.01	4.57	%
Pyritic Sulfur (as S)	1.32	1.66	1.90	0.02	0.03	3.29	%
Sulfur, Unidentified (as S)	0.06	<0.01	0.33	<0.01	<0.01	1.22	%
Sulfate Sulfur (%)	0.02	0.01	0.16	0.05	0.01	0.06	%
APP/Peroxide (as S)	0.69	0.58	<0.01	<0.01	<0.01	2.37	%
Total Sulfur (Tons CaCO3/Kt)	43.8	50.3	67.2	0.6	<0.3	143	Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	41.2	51.9	59.4	0.6	0.9	103	Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	13.1	21.6	18.1	<0.1	<0.1	74.1	Tons CaCO3/Kt
Acid Neutralizing Potential	224	122	4.8	3.8	13.9	0.4	Tons CaCO3/Kt
Arsenic, Total (As)	709	1170	1010	113	1070	5290	mg/Kg
Barium, Total (Ba)	140	189	32	179	400	155	mg/Kg
Boron, Total (B)	<5	<5	<5	<5	<5	<10	mg/Kg

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PROJECT: 0739-008-203/WASTE SAMPLE: WR-6P REM:

SAMPLE NUMBER: 20 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-7P REM:

SAMPLE NUMBER: 21 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-8P REM:

SAMPLE NUMBER: 22 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-9P REM:

SAMPLE NUMBER: 23 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-10P REM:

SAMPLE NUMBER: 24 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :
PROJECT: 0739-008-203/WASTE SAMPLE: WR-11P REM:

TEST DESCRIPTION	SAMPLE 19	SAMPLE 20	SAMPLE 21	SAMPLE 22	SAMPLE 23	SAMPLE 24	UNITS OF MEASURE
Cadmium, Total (Cd)	1	<1	38	<1	20	6	mg/Kg
Chromium, Total (Cr)	8	20	40	32	17	4	mg/Kg
Copper, Total (Cu)	30	8	192	146	66	32	mg/Kg
Iron, Total (Fe)	26300	40700	23900	15000	16000	43300	mg/Kg
Lead, Total (Pb)	7	6	13	40	10	44	mg/Kg
Mercury, Total (Hg)	0.48	<0.15	16.6	1.83	8.00	2.46	mg/Kg
Magnesium, Total (Mg)	10500	13900	524	353	1400	315	mg/Kg
Manganese, Total (Mn)	432	579	30	36	222	16	mg/Kg
Nickel, Total (Ni)	46	8	216	8	68	48	mg/Kg
Selenium, Total (Se)	<10	<10	20	10	<10	10	mg/Kg
Silver, Total (Ag)	<1	<1	4	<1	<1	2	mg/Kg
Thallium, Total (Tl)	<20	<20	<20	<20	<20	20	mg/Kg

APPROVED BY: David McWhorter

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CORE LABORATORIES

LABORATORY TESTS RESULTS
07/30/90

JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 25 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :

PROJECT: 0739-008-203/WASTE SAMPLE: WR-12P REM:

SAMPLE NUMBER: 26 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :

PROJECT: 0739-008-203/WASTE SAMPLE: WR-13P REM:

TEST DESCRIPTION	SAMPLE 25	SAMPLE 26					UNITS OF MEASURE
Total Sulfur (as S)	0.56	0.45					%
Pyritic Sulfur (as S)	0.47	0.49					%
Sulfur, Unidentified (as S)	0.09	<0.01					%
Sulfate Sulfur (%)	<0.01	0.10					%
APP/Peroxide (as S)	0.02	0.40					%
Total Sulfur (Tons CaCO3/Kt)	17.5	14.1					Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	14.7	15.3					Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	0.6	12.5					Tons CaCO3/Kt
Acid Neutralizing Potential	191	15.0					Tons CaCO3/Kt
Arsenic, Total (As)	273	96					mg/Kg
Barium, Total (Ba)	118	92					mg/Kg
Boron, Total (B)	<5	<10					mg/Kg

APPROVED BY: David McWhorter

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CORE LABORATORIES

LABORATORY TESTS RESULTS
07/30/90

JOB NUMBER: 900804 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 25 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :

PROJECT: 0739-008-203/WASTE SAMPLE: WR-12P REM:

SAMPLE NUMBER: 26 DATE RECEIVED: 05/29/90 TIME RECEIVED: 14:00 SAMPLE DATE: / / SAMPLE TIME: :

PROJECT: 0739-008-203/WASTE SAMPLE: WR-13P REM:

TEST DESCRIPTION	SAMPLE 25	SAMPLE 26					UNITS OF MEASURE
Cadmium, Total (Cd)	<1	<1					mg/Kg
Chromium, Total (Cr)	72	42					mg/Kg
Copper, Total (Cu)	20	44					mg/Kg
Iron, Total (Fe)	33600	22400					mg/Kg
Lead, Total (Pb)	6	9					mg/Kg
Mercury, Total (Hg)	<0.15	1.35					mg/Kg
Magnesium, Total (Mg)	15500	224					mg/Kg
Manganese, Total (Mn)	562	135					mg/Kg
Nickel, Total (Ni)	66	37					mg/Kg
Selenium, Total (Se)	<10	<10					mg/Kg
Silver, Total (Ag)	<1	<1					mg/Kg
Thallium, Total (Tl)	<20	<20					mg/Kg

APPROVED BY: David McWhorter

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A-3 - Core Labs Report #901186

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CORE LABORATORIES

ANALYTICAL REPORT

901186

FOR

ENSR CONSULTING & ENGINEERING

1716 HEATH PARKWAY
FORT COLLINS, CO 80524

09/07/90

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CORE LABORATORIES

LABORATORY TESTS RESULTS
09/07/90

JOB NUMBER: 901186 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 1 DATE RECEIVED: 08/13/90 TIME RECEIVED: 12:00 SAMPLE DATE: 08/10/90 SAMPLE TIME: 11:30

PROJECT: 0739-001-203 SAMPLE: B-4 REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 08/13/90 TIME RECEIVED: 12:00 SAMPLE DATE: 08/10/90 SAMPLE TIME: 11:30

PROJECT: 0739-001-203 SAMPLE: B-7 REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2					UNITS OF MEASURE
Total Sulfur (as S)	1.50	0.09					%
Pyritic Sulfur (as S)	1.37	0.06					%
Sulfur, Unidentified (as S)	0.07	0.03					%
Sulfate Sulfur (%)	0.06	<0.01					%
APP/Peroxide (as S)	0.88	<0.01					%
Total Sulfur (Tons CaCO3/Kt)	46.9	2.8					Tons CaCO3/Kt
Pyritic Sulfur, (Tons CaCO3/Kt)	42.8	1.9					Tons CaCO3/Kt
APP/Peroxide (Tons CaCO3/Kt)	27.5	<0.1					Tons CaCO3/Kt
Acid Neutralizing Potential	17.5	3.6					Tons CaCO3/Kt
Arsenic, Total (As)	2000	210					mg/Kg
Barium, Total (Ba)	150	190					mg/Kg
Cadmium, Total (Cd)	4.7	<0.5					mg/Kg

APPROVED BY: Nancy Holland-Dow

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CORE LABORATORIES

LABORATORY TESTS RESULTS
09/07/90

JOB NUMBER: 901186 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 1 DATE RECEIVED: 08/13/90 TIME RECEIVED: 12:00 SAMPLE DATE: 08/10/90 SAMPLE TIME: 11:30
PROJECT: 0739-001-203 SAMPLE: B-4 REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 08/13/90 TIME RECEIVED: 12:00 SAMPLE DATE: 08/10/90 SAMPLE TIME: 11:30
PROJECT: 0739-001-203 SAMPLE: B-7 REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2					UNITS OF MEASURE
Chromium, Total (Cr)	23	10					mg/Kg
Copper, Total (Cu)	96	25					mg/Kg
Iron, Total (Fe)	45600	6200					mg/Kg
Lead, Total (Pb)	9	5					mg/Kg
Mercury, Total (Hg)	1.79	0.80					mg/Kg
Magnesium, Total (Mg)	4000	107					mg/Kg
Manganese, Total (Mn)	1050	490					mg/Kg
Nickel, Total (Ni)	240	8					mg/Kg
Selenium, Total (Se)	<20	<10					mg/Kg
Silver, Total (Ag)	<1	<1					mg/Kg
Thallium, Total (Tl)	<20	<10					mg/Kg

APPROVED BY: Nancy Vollan L-Dow

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APPENDIX B

HUMIDITY CELL TEST RESULTS

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CORE LABORATORIES

ANALYTICAL REPORT

900805

FOR

ENSR CONSULTING & ENGINEERING

1716 HEATH PARKWAY
FORT COLLINS, CO 80524

08/31/90

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 25 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-1

SAMPLE NUMBER: 26 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-2

SAMPLE NUMBER: 27 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-3

SAMPLE NUMBER: 28 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-5

SAMPLE NUMBER: 29 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-6

SAMPLE NUMBER: 30 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-8

TEST DESCRIPTION	SAMPLE 25	SAMPLE 26	SAMPLE 27	SAMPLE 28	SAMPLE 29	SAMPLE 30	UNITS OF MEASURE
Acidity (Filt.)	<10	<10	<10	<10	282	<10	mg/L CaCO3
Conductivity (Filt.)	220	153	35	93	1550	224	umhos/cm @25dF
pH (Filt.)	7.18	8.08	6.93	7.02	4.45	8.03	pH Units
Sulfate (Filt.)	80	27	<10	15	952	36	mg/L
Arsenic, Diss. (As)	<0.05	0.13	0.17	<0.05	0.07	0.36	mg/L
Barium, Diss. (Ba)	0.07	<0.01	<0.01	<0.01	0.06	0.05	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	0.311	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	<0.01	<0.01	0.83	<0.01	mg/L
Iron, Diss. (Fe)	0.15	<0.03	<0.03	<0.03	93	<0.03	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L

APPROVED BY: Nancy Volland-Dow

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

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PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-1

SAMPLE NUMBER: 26 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-2

SAMPLE NUMBER: 27 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-3

SAMPLE NUMBER: 28 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-5

SAMPLE NUMBER: 29 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-6

SAMPLE NUMBER: 30 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-8

TEST DESCRIPTION	SAMPLE 25	SAMPLE 26	SAMPLE 27	SAMPLE 28	SAMPLE 29	SAMPLE 30	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.0015	<0.0006	<0.0006	<0.0015	<0.0015	<0.0006	mg/L
Magnesium, Diss. (Mg)	3.63	1.49	0.30	0.13	31	2.81	mg/L
Manganese, Diss. (Mn)	0.82	<0.01	<0.01	<0.01	7.20	0.03	mg/L
Nickel, Diss. (Ni)	<0.04	<0.04	<0.04	<0.04	6.30	<0.04	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Vorland-Davis

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 31 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-9

SAMPLE NUMBER: 32 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-10

SAMPLE NUMBER: 33 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-11

SAMPLE NUMBER: 34 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-12

SAMPLE NUMBER: 35 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-13

SAMPLE NUMBER: 36 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-14

TEST DESCRIPTION	SAMPLE 31	SAMPLE 32	SAMPLE 33	SAMPLE 34	SAMPLE 35	SAMPLE 36	UNITS OF MEASURE
Acidity (Filt.)	<10	<10	82	<10	24	<10	mg/L CaCO3
Conductivity (Filt.)	400	158	574	128	325	162	umhos/cm @25dF
pH (Filt.)	7.97	8.16	4.83	8.08	5.59	7.87	pH Units
Sulfate (Filt.)	104	24	253	<10	129	40	mg/L
Arsenic, Diss. (As)	0.05	0.23	7.11	<0.05	0.20	0.05	mg/L
Barium, Diss. (Ba)	0.05	0.01	0.05	<0.01	0.08	0.04	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Iron, Diss. (Fe)	<0.03	<0.03	29	0.34	6.00	<0.03	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L

APPROVED BY: Nancy Vorland - Dow

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08/31/90

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SAMPLE NUMBER: 31 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-9

SAMPLE NUMBER: 32 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-10

SAMPLE NUMBER: 33 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-11

SAMPLE NUMBER: 34 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-12

SAMPLE NUMBER: 35 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-13

SAMPLE NUMBER: 36 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: B-14

TEST DESCRIPTION	SAMPLE 31	SAMPLE 32	SAMPLE 33	SAMPLE 34	SAMPLE 35	SAMPLE 36	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.0006	<0.0006	<0.0015	<0.0015	<0.0015	<0.0006	mg/L
Magnesium, Diss. (Mg)	10.2	3.98	12.7	2.36	8.25	1.56	mg/L
Manganese, Diss. (Mn)	<0.01	0.03	2.96	0.02	6.35	0.03	mg/L
Nickel, Diss. (Ni)	<0.04	<0.04	0.36	<0.04	0.57	<0.04	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Volland-Dow

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 37 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-1P

SAMPLE NUMBER: 38 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-2P

SAMPLE NUMBER: 39 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-3P

SAMPLE NUMBER: 40 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-4P

SAMPLE NUMBER: 41 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-5P

SAMPLE NUMBER: 42 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-6P

TEST DESCRIPTION	SAMPLE 37	SAMPLE 38	SAMPLE 39	SAMPLE 40	SAMPLE 41	SAMPLE 42	UNITS OF MEASURE
Acidity (Filt.)	<10	<10	<10	<10	14	11	mg/L CaCO3
Conductivity (Filt.)	588	1010	109	113	1030	268	umhos/cm @25dF
pH (Filt.)	7.93	7.78	8.42	7.95	6.23	5.68	pH Units
Sulfate (Filt.)	227	430	12	15	494	103	mg/L
Arsenic, Diss. (As)	0.58	0.09	0.09	0.06	0.13	0.07	mg/L
Barium, Diss. (Ba)	0.04	0.03	<0.01	0.03	0.06	0.07	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Iron, Diss. (Fe)	<0.03	1.11	<0.03	<0.03	7.50	3.26	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L

APPROVED BY: Nancy Volland C. Dow

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 37 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-1P

SAMPLE NUMBER: 38 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-2P

SAMPLE NUMBER: 39 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-3P

SAMPLE NUMBER: 40 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-4P

SAMPLE NUMBER: 41 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-5P

SAMPLE NUMBER: 42 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-6P

TEST DESCRIPTION	SAMPLE 37	SAMPLE 38	SAMPLE 39	SAMPLE 40	SAMPLE 41	SAMPLE 42	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.0006	<0.0006	<0.0006	<0.0015	<0.0015	<0.0006	mg/L
Magnesium, Diss. (Mg)	11.5	20	2.28	2.19	54	4.98	mg/L
Manganese, Diss. (Mn)	1.76	0.62	<0.01	<0.01	0.77	3.27	mg/L
Nickel, Diss. (Ni)	<0.04	1.15	<0.04	<0.04	0.19	0.29	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Vickland-Dow

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 43 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-7P

SAMPLE NUMBER: 44 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-8P

SAMPLE NUMBER: 45 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-9P

SAMPLE NUMBER: 46 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-10P

SAMPLE NUMBER: 47 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-12P

SAMPLE NUMBER: 48 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-13P

TEST DESCRIPTION	SAMPLE 43	SAMPLE 44	SAMPLE 45	SAMPLE 46	SAMPLE 47	SAMPLE 48	UNITS OF MEASURE
Acidity (Filt.)	<10	254	16	13	<10	14	mg/L CaCO3
Conductivity (Filt.)	1490	1420	221	245	28	171	umhos/cm @25dF
pH (Filt.)	7.13	3.10	4.72	4.69	6.73	4.90	pH Units
Sulfate (Filt.)	808	718	78	96	<10	64	mg/L
Arsenic, Diss. (As)	0.16	1.93	0.11	0.08	<0.05	0.16	mg/L
Barium, Diss. (Ba)	0.03	0.05	0.05	0.08	<0.01	0.05	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	0.115	<0.005	<0.005	<0.005	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	0.93	0.02	0.17	0.04	0.08	mg/L
Iron, Diss. (Fe)	0.03	64	0.67	0.91	0.04	3.15	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L

APPROVED BY: Nancy Vorland-Dow

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PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-7P

SAMPLE NUMBER: 44 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-8P

SAMPLE NUMBER: 45 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-9P

SAMPLE NUMBER: 46 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-10P

SAMPLE NUMBER: 47 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-12P

SAMPLE NUMBER: 48 DATE RECEIVED: 06/11/90 TIME RECEIVED: 15:20 SAMPLE DATE: 06/11/90 SAMPLE TIME: 15:20
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 1 REM: WR-13P

TEST DESCRIPTION	SAMPLE 43	SAMPLE 44	SAMPLE 45	SAMPLE 46	SAMPLE 47	SAMPLE 48	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.003	<0.0015	<0.0015	<0.0006	<0.0006	<0.0006	mg/L
Magnesium, Diss. (Mg)	11.1	31	3.84	5.83	0.15	3.10	mg/L
Manganese, Diss. (Mn)	3.88	0.81	0.18	0.06	<0.01	0.10	mg/L
Nickel, Diss. (Ni)	0.23	5.65	0.12	0.50	<0.04	0.23	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 49 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-1

SAMPLE NUMBER: 50 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-2

SAMPLE NUMBER: 51 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-3

SAMPLE NUMBER: 52 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-5

SAMPLE NUMBER: 53 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-6

SAMPLE NUMBER: 54 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-8

TEST DESCRIPTION	SAMPLE 49	SAMPLE 50	SAMPLE 51	SAMPLE 52	SAMPLE 53	SAMPLE 54	UNITS OF MEASURE
Acidity (Filt.)	<10	<10	<10	<10	355	<10	mg/L CaCO3
Conductivity (Filt.)	525	275	78	127	1760	324	umhos/cm @25dF
pH (Filt.)	6.11	7.64	6.04	7.22	3.63	7.50	pH Units
Sulfate (Filt.)	218	79	26	27	730	76	mg/L
Arsenic, Diss. (As)	<0.05	0.05	<0.05	<0.05	0.22	0.33	mg/L
Barium, Diss. (Ba)	0.03	0.01	<0.01	<0.01	0.02	0.05	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	0.017	<0.005	0.874	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	0.06	<0.01	6.20	<0.01	mg/L
Iron, Diss. (Fe)	0.04	<0.03	0.18	<0.03	38	<0.03	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L

APPROVED BY: Nancy Vorland-Dow

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 49 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-1

SAMPLE NUMBER: 50 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-2

SAMPLE NUMBER: 51 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-3

SAMPLE NUMBER: 52 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-5

SAMPLE NUMBER: 53 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-6

SAMPLE NUMBER: 54 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-8

TEST DESCRIPTION	SAMPLE 49	SAMPLE 50	SAMPLE 51	SAMPLE 52	SAMPLE 53	SAMPLE 54	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.0015	<0.003	<0.0015	<0.0015	<0.0006	<0.0006	mg/L
Magnesium, Diss. (Mg)	11.4	2.84	1.42	0.60	62	5.14	mg/L
Manganese, Diss. (Mn)	2.52	0.08	0.60	0.03	36	0.02	mg/L
Nickel, Diss. (Ni)	0.06	<0.04	0.24	<0.04	14.7	<0.04	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	mg/L

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 55 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-9

SAMPLE NUMBER: 56 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-10

SAMPLE NUMBER: 57 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-11

SAMPLE NUMBER: 58 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-12

SAMPLE NUMBER: 59 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-13

SAMPLE NUMBER: 60 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-14

TEST DESCRIPTION	SAMPLE 55	SAMPLE 56	SAMPLE 57	SAMPLE 58	SAMPLE 59	SAMPLE 60	UNITS OF MEASURE
Acidity (Filt.)	<10	<10	228	<10	41	<10	mg/L CaCO3
Conductivity (Filt.)	625	242	855	97	437	178	umhos/cm @25dF
pH (Filt.)	7.23	7.57	3.93	7.89	5.08	7.65	pH Units
Sulfate (Filt.)	81	73	405	<10	198	57	mg/L
Arsenic, Diss. (As)	<0.05	<0.05	19.4	<0.05	0.16	<0.05	mg/L
Barium, Diss. (Ba)	0.04	<0.01	0.03	<0.01	0.04	0.06	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	0.02	<0.01	0.02	<0.01	mg/L
Iron, Diss. (Fe)	<0.03	<0.03	56	<0.03	1.57	<0.03	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L

APPROVED BY: Nancy Vorland-Dow

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 55 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-9

SAMPLE NUMBER: 56 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-10

SAMPLE NUMBER: 57 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-11

SAMPLE NUMBER: 58 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-12

SAMPLE NUMBER: 59 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-13

SAMPLE NUMBER: 60 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: B-14

TEST DESCRIPTION	SAMPLE 55	SAMPLE 56	SAMPLE 57	SAMPLE 58	SAMPLE 59	SAMPLE 60	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.0006	<0.0015	<0.0006	<0.0006	<0.0015	<0.0015	mg/L
Magnesium, Diss. (Mg)	18.3	7.08	26	1.71	13.6	1.95	mg/L
Manganese, Diss. (Mn)	0.01	0.23	14.0	0.11	26	0.17	mg/L
Nickel, Diss. (Ni)	<0.04	<0.04	0.07	<0.04	0.61	<0.04	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Vorhees C-Dow

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 61 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-1P

SAMPLE NUMBER: 62 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-2P

SAMPLE NUMBER: 63 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-3P

SAMPLE NUMBER: 64 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-4P

SAMPLE NUMBER: 65 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-5P

SAMPLE NUMBER: 66 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-6P

TEST DESCRIPTION	SAMPLE 61	SAMPLE 62	SAMPLE 63	SAMPLE 64	SAMPLE 65	SAMPLE 66	UNITS OF MEASURE
Acidity (Filt.)	<10	34	<10	<10	60	36	mg/L CaCO3
Conductivity (Filt.)	830	1020	185	196	1300	543	umhos/cm @25dF
pH (Filt.)	7.53	7.67	7.78	7.66	6.84	5.10	pH Units
Sulfate (Filt.)	417	504	48	58	745	258	mg/L
Arsenic, Diss. (As)	0.26	0.07	<0.05	<0.05	0.29	0.05	mg/L
Barium, Diss. (Ba)	0.04	0.03	<0.01	0.01	0.05	0.05	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	<0.005	0.05	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	mg/L
Iron, Diss. (Fe)	<0.03	<0.03	<0.03	<0.03	<0.03	1.21	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L

APPROVED BY: Nancy Vorland-Dow

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PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-1P

SAMPLE NUMBER: 62 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-2P

SAMPLE NUMBER: 63 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-3P

SAMPLE NUMBER: 64 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-4P

SAMPLE NUMBER: 65 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-5P

SAMPLE NUMBER: 66 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-6P

TEST DESCRIPTION	SAMPLE 61	SAMPLE 62	SAMPLE 63	SAMPLE 64	SAMPLE 65	SAMPLE 66	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	mg/L
Magnesium, Diss. (Mg)	21	23	4.45	4.55	75	12.7	mg/L
Manganese, Diss. (Mn)	4.33	0.70	0.11	0.07	0.99	19.0	mg/L
Nickel, Diss. (Ni)	<0.04	0.19	<0.04	<0.04	0.14	0.54	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Vorland-Dows

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 67 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-7P

SAMPLE NUMBER: 68 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-8P

SAMPLE NUMBER: 69 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-9P

SAMPLE NUMBER: 70 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-10P

SAMPLE NUMBER: 71 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-12P

SAMPLE NUMBER: 72 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-13P

TEST DESCRIPTION	SAMPLE 67	SAMPLE 68	SAMPLE 69	SAMPLE 70	SAMPLE 71	SAMPLE 72	UNITS OF MEASURE
Acidity (Filt.)	<10	317	12	26	<10	28	mg/L CaCO3
Conductivity (Filt.)	880	1330	355	747	72	319	umhos/cm @25dF
pH (Filt.)	7.03	3.29	4.73	4.41	7.01	4.63	pH Units
Sulfate (Filt.)	444	680	141	351	20	126	mg/L
Arsenic, Diss. (As)	<0.05	0.09	0.09	0.15	<0.05	<0.05	mg/L
Barium, Diss. (Ba)	0.04	0.05	0.05	0.03	<0.01	0.02	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	0.04	0.04	0.46	<0.01	0.03	mg/L
Iron, Diss. (Fe)	<0.03	99	<0.03	0.58	0.03	8.8	mg/L
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	0.09	<0.05	<0.05	mg/L

APPROVED BY: Nancy Volland-Dow

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PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-7P

SAMPLE NUMBER: 68 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-8P

SAMPLE NUMBER: 69 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-9P

SAMPLE NUMBER: 70 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
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SAMPLE NUMBER: 71 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-12P

SAMPLE NUMBER: 72 DATE RECEIVED: 06/18/90 TIME RECEIVED: 14:20 SAMPLE DATE: 06/18/90 SAMPLE TIME: 10:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 2 REM: WR-13P

TEST DESCRIPTION	SAMPLE 67	SAMPLE 68	SAMPLE 69	SAMPLE 70	SAMPLE 71	SAMPLE 72	UNITS OF MEASURE
Mercury, Diss. (Hg)	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	mg/L
Magnesium, Diss. (Mg)	15.9	7.78	7.87	28	0.55	8.48	mg/L
Manganese, Diss. (Mn)	10.2	0.57	0.58	0.62	<0.01	0.51	mg/L
Nickel, Diss. (Ni)	0.07	0.15	0.16	3.20	<0.04	0.20	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Vorland-Dow

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 241 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-1

SAMPLE NUMBER: 242 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-2

SAMPLE NUMBER: 243 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-3

SAMPLE NUMBER: 244 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-5

SAMPLE NUMBER: 245 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-6

SAMPLE NUMBER: 246 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-8

TEST DESCRIPTION	SAMPLE 241	SAMPLE 242	SAMPLE 243	SAMPLE 244	SAMPLE 245	SAMPLE 246	UNITS OF MEASURE
Acidity (Filt.)	<10	<10	<10	<10	292	<10	mg/L CaCO3
Conductivity (Filt.)	191	125	22	24	1230	123	umhos/cm @25dF
pH (Filt.)	5.54	6.87	6.55	6.61	3.26	6.69	pH Units
Sulfate (Filt.)					696		mg/L
Sulfate (Filt.)	70	30	<10	<10		30	mg/L
Arsenic, Diss. (As)	<0.05	0.11	0.13	<0.05	0.21	0.15	mg/L
Barium, Diss. (Ba)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	0.777	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	<0.01	<0.01	5.19	<0.01	mg/L
Iron, Diss. (Fe)	<0.03	<0.03	<0.03	<0.03	22	<0.03	mg/L

APPROVED BY: Nancy Vailsul-Dow

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PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-1

SAMPLE NUMBER: 242 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-2

SAMPLE NUMBER: 243 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-3

SAMPLE NUMBER: 244 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-5

SAMPLE NUMBER: 245 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-6

SAMPLE NUMBER: 246 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-8

TEST DESCRIPTION	SAMPLE 241	SAMPLE 242	SAMPLE 243	SAMPLE 244	SAMPLE 245	SAMPLE 246	UNITS OF MEASURE
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Mercury, Diss. (Hg)	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/L
Magnesium, Diss. (Mg)	3.06	1.61	0.19	0.02	12.0	2.32	mg/L
Manganese, Diss. (Mn)	3.06	0.03	<0.01	<0.01	5.23	0.02	mg/L
Nickel, Diss. (Ni)	0.15	<0.04	<0.04	<0.04	3.76	<0.04	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Volland-Dow

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JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 247 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-9

SAMPLE NUMBER: 248 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-10

SAMPLE NUMBER: 249 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-11

SAMPLE NUMBER: 250 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-12

SAMPLE NUMBER: 251 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-13

SAMPLE NUMBER: 252 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-14

TEST DESCRIPTION	SAMPLE 247	SAMPLE 248	SAMPLE 249	SAMPLE 250	SAMPLE 251	SAMPLE 252	UNITS OF MEASURE
Acidity (Filt.)	<10	<10	102	<10	21	<10	mg/L CaCO3
Conductivity (Filt.)	165	87	483	64	133	64	umhos/cm @25dF
pH (Filt.)	6.78	7.12	3.56	7.75	4.76	7.43	pH Units
Sulfate (Filt.)			207				mg/L
Sulfate (Filt.)	48	11		<10	48	10	mg/L
Arsenic, Diss. (As)	0.07	0.13	19.4	<0.05	0.47	<0.05	mg/L
Barium, Diss. (Ba)	<0.01	<0.01	0.02	<0.01	0.05	0.01	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	0.07	0.01	0.05	<0.01	mg/L
Iron, Diss. (Fe)	<0.03	<0.03	65	0.22	0.79	<0.03	mg/L

APPROVED BY: Nancy Vaiskunas-Dow

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SAMPLE NUMBER: 247 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-9

SAMPLE NUMBER: 248 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-10

SAMPLE NUMBER: 249 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-11

SAMPLE NUMBER: 250 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-12

SAMPLE NUMBER: 251 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-13

SAMPLE NUMBER: 252 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: B-14

TEST DESCRIPTION	SAMPLE 247	SAMPLE 248	SAMPLE 249	SAMPLE 250	SAMPLE 251	SAMPLE 252	UNITS OF MEASURE
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Mercury, Diss. (Hg)	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/L
Magnesium, Diss. (Mg)	3.98	2.63	7.50	1.18	2.46	0.65	mg/L
Manganese, Diss. (Mn)	<0.01	0.06	6.50	0.02	11.3	0.04	mg/L
Nickel, Diss. (Ni)	<0.04	<0.04	0.42	<0.04	0.80	<0.04	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Vorland-Dow

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 253 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-1P

SAMPLE NUMBER: 254 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-2P

SAMPLE NUMBER: 255 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-3P

SAMPLE NUMBER: 256 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-4P

SAMPLE NUMBER: 257 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-5P

SAMPLE NUMBER: 258 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-6P

TEST DESCRIPTION	SAMPLE 253	SAMPLE 254	SAMPLE 255	SAMPLE 256	SAMPLE 257	SAMPLE 258	UNITS OF MEASURE
Acidity (Filt.)	<10	24	<10	<10	14	<10	mg/L CaCO3
Conductivity (Filt.)	336	601	75	74	1000	98	umhos/cm @25dF
pH (Filt.)	6.24	6.21	7.46	7.21	6.23	5.85	pH Units
Sulfate (Filt.)		275			528		mg/L
Sulfate (Filt.)	131		<10	<10		35	mg/L
Arsenic, Diss. (As)	0.83	0.16	0.08	<0.05	0.47	<0.05	mg/L
Barium, Diss. (Ba)	0.02	0.02	<0.01	<0.01	0.03	0.05	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Iron, Diss. (Fe)	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	mg/L

APPROVED BY: Nancy Volkert-Drew

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 253 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-1P

SAMPLE NUMBER: 254 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-2P

SAMPLE NUMBER: 255 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-3P

SAMPLE NUMBER: 256 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-4P

SAMPLE NUMBER: 257 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-5P

SAMPLE NUMBER: 258 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-6P

TEST DESCRIPTION	SAMPLE 253	SAMPLE 254	SAMPLE 255	SAMPLE 256	SAMPLE 257	SAMPLE 258	UNITS OF MEASURE
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Mercury, Diss. (Hg)	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/L
Magnesium, Diss. (Mg)	4.32	8.52	1.37	1.48	65	1.70	mg/L
Manganese, Diss. (Mn)	0.73	0.11	<0.01	<0.01	0.64	3.02	mg/L
Nickel, Diss. (Ni)	<0.04	<0.04	<0.04	<0.04	<0.04	0.09	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Voiland-Dow

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 259 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-7P

SAMPLE NUMBER: 260 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-8P

SAMPLE NUMBER: 261 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-9P

SAMPLE NUMBER: 262 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-10P

SAMPLE NUMBER: 263 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-12P

SAMPLE NUMBER: 264 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-13P

TEST DESCRIPTION	SAMPLE 259	SAMPLE 260	SAMPLE 261	SAMPLE 262	SAMPLE 263	SAMPLE 264	UNITS OF MEASURE
Acidity (Filt.)	<10	167	11	35	<10	<10	mg/L CaCO3
Conductivity (Filt.)	275	790	64	319	18	70	umhos/cm @25dF
pH (Filt.)	6.27	3.26	5.41	4.10	6.60	5.73	pH Units
Sulfate (Filt.)		386					mg/L
Sulfate (Filt.)	110		20	120	<10	23	mg/L
Arsenic, Diss. (As)	<0.05	3.14	0.07	0.10	0.06	0.41	mg/L
Barium, Diss. (Ba)	0.05	<0.01	0.01	0.01	<0.01	<0.01	mg/L
Boron, Diss. (B)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Cadmium, Diss. (Cd)	<0.005	0.107	<0.005	<0.005	<0.005	<0.005	mg/L
Chromium, Diss. (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Copper, Diss. (Cu)	<0.01	0.75	<0.01	0.71	<0.01	0.04	mg/L
Iron, Diss. (Fe)	<0.03	26	<0.03	1.35	0.12	0.05	mg/L

APPROVED BY: Nancy Vorlicek-Dows

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LABORATORY TESTS RESULTS
08/31/90

JOB NUMBER: 900805 CUSTOMER: ENSR CONSULTING & ENGINEERING ATTN:

SAMPLE NUMBER: 259 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-7P

SAMPLE NUMBER: 260 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-8P

SAMPLE NUMBER: 261 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-9P

SAMPLE NUMBER: 262 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-10P

SAMPLE NUMBER: 263 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-12P

SAMPLE NUMBER: 264 DATE RECEIVED: 08/13/90 TIME RECEIVED: 11:45 SAMPLE DATE: 08/13/90 SAMPLE TIME: 00:00
PROJECT: 0739-008-203/HUMIDITY CELLS SAMPLE: HCT WEEK 10 REM: WR-13P

TEST DESCRIPTION	SAMPLE 259	SAMPLE 260	SAMPLE 261	SAMPLE 262	SAMPLE 263	SAMPLE 264	UNITS OF MEASURE
Lead, Diss. (Pb)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/L
Mercury, Diss. (Hg)	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/L
Magnesium, Diss. (Mg)	1.78	15.5	0.93	6.93	0.07	1.13	mg/L
Manganese, Diss. (Mn)	0.66	1.14	0.13	0.37	<0.01	0.12	mg/L
Nickel, Diss. (Ni)	<0.04	2.42	<0.04	1.37	<0.04	0.10	mg/L
Selenium, Diss. (Se)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L
Silver, Diss. (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
Thallium, Diss. (Tl)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/L

APPROVED BY: Nancy Voiland-Dow

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SUMMARY OF DATA GENERATED FROM HUMIDITY CELL TESTING
ENSR CONSULTING & ENGINEERING
August 31, 1990

CLIENT SAMPLE I.D.: B-1/0739-008-203
LAB SAMPLE I.D.: 900805-1

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	123	120	110	100	109	113	122	116	124	121
pH	pH Units	7.18	6.11	5.53	5.51	5.81	5.67	5.77	6.12	5.35	5.54
Conductivity	umohs/cm	220	525	587	556	477	373	262	250	240	191
Sulfate	mg/L	80	218	240	241	196	149	111	102	87	70
Cumulative Sulfate	Total mg	10	36	62	87	108	125	138	150	161	169
Acidity	mg/L CaCO3	<10	<10	14	11	19	<10	<10	14	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	2	3	5	5	5	6	6	6
Iron (Diss.)	mg/L	0.15	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.10	<0.03
Cumulative Iron	Total ug	18	23	23	23	23	23	23	23	36	36

CLIENT SAMPLE I.D.: B-2/0739-008-203
LAB SAMPLE I.D.: 900805-2

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	142	140	147	133	141	134	129	134	151	144
pH	pH Units	8.08	7.64	5.95	6.60	7.04	6.96	7.30	7.07	6.87	6.87
Conductivity	umohs/cm	153	275	262	265	253	180	167	189	144	125
Sulfate	mg/L	27	79	84	76	77	54	42	45	36	30
Cumulative Sulfate	Total mg	4	15	27	37	48	55	61	67	72	77
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	0.11	<0.03	0.12	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	15	15	31	31	31	31	31

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SUMMARY OF DATA GENERATED FROM HUMIDITY CELL TESTING
ENSR CONSULTING & ENGINEERING
August 31, 1990

CLIENT SAMPLE I.D.: B-3/0739-008-203
LAB SAMPLE I.D.: 900805-3

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	143	137	137	127	142	137	136	136	151	140
pH	pH Units	6.93	6.04	5.93	6.04	6.47	6.49	6.70	6.72	6.17	6.55
Conductivity	umohs/cm	35	78	40	41	32	26	29	42	28	22
Sulfate	mg/L	<10	26	<10	<10	<10	<10	<10	<10	16	<10
Cumulative Sulfate	Total mg	0	4	4	4	4	4	4	4	6	6
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	0.18	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.26	<0.03
Cumulative Iron	Total ug	0	25	25	25	25	25	25	25	64	64

CLIENT SAMPLE I.D.: B-5/0739-008-203
LAB SAMPLE I.D.: 900805-4

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	114	99	110	106	117	123	126	125	136	131
pH	pH Units	7.02	7.22	5.98	6.03	6.31	5.96	6.48	6.58	6.45	6.61
Conductivity	umohs/cm	93	127	121	108	67	49	50	38	36	24
Sulfate	mg/L	15	27	26	27	17	11	12	<10	<10	<10
Cumulative Sulfate	Total mg	2	4	7	10	12	13	15	15	15	15
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	0.14	0.14	0.08	0.22	<0.03
Cumulative Iron	Total ug	0	0	0	0	0	17	35	45	75	75

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SUMMARY OF DATA GENERATED FROM HUMIDITY CELL TESTING
ENSR CONSULTING & ENGINEERING
August 31, 1990

CLIENT SAMPLE I.D.: B-6/0739-008-203
LAB SAMPLE I.D.: 900805-5

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	124	143	169	122	132	130	130	134	155	135
pH	pH Units	4.45	3.63	3.57	3.43	3.44	3.48	3.41	3.28	3.28	3.26
Conductivity	umohs/cm	1550	1760	1290	1700	1520	1270	1220	1390	1090	1230
Sulfate	mg/L	952	730	775	1060	826	700	755	841	566	696
Cumulative Sulfate	Total mg	118	222	353	483	592	683	781	894	981	1075
Acidity	mg/L CaCO3	282	355	251	359	297	232	279	332	252	292
Cumulative Acidity	Tot. mg CaCO3	35	86	128	172	211	241	278	322	361	401
Iron (Diss.)	mg/L	93	38	18.1	39	40	29	40	47	51	22
Cumulative Iron	Total ug	11532	16966	20025	24783	30063	33833	39033	45331	53236	56206

CLIENT SAMPLE I.D.: B-8/0739-008-203
LAB SAMPLE I.D.: 900805-6

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	154	155	158	148	156	147	150	148	181	154
pH	pH Units	8.03	7.50	5.86	6.94	6.61	7.00	7.24	6.52	6.93	6.69
Conductivity	umohs/cm	224	324	243	190	145	134	125	145	110	123
Sulfate	mg/L	36	76	72	47	37	40	25	38	16	30
Cumulative Sulfate	Total mg	6	17	29	36	41	47	51	57	60	64
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.14	0.17	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	0	0	0	21	46	46	46

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SUMMARY OF DATA GENERATED FROM HUMIDITY CELL TESTING
ENSR CONSULTING & ENGINEERING
August 31, 1990

CLIENT SAMPLE I.D.: B-9/0739-008-203
LAB SAMPLE I.D.: 900805-7

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	126	137	134	130	138	140	138	132	134	144
pH	pH Units	7.97	7.23	5.92	6.53	6.53	6.93	7.17	6.72	6.73	6.78
Conductivity	umohs/cm	400	625	722	628	411	295	266	259	187	165
Sulfate	mg/L	104	81	324	258	160	114	91	89	53	48
Cumulative Sulfate	Total mg	13	24	68	101	123	139	152	164	171	178
Acidity	mg/L CaCO3	<10	<10	17	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	2	2	2	2	2	2	2	2
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	0	0	0	0	0	0	0

CLIENT SAMPLE I.D.: B-10/0739-008-203
LAB SAMPLE I.D.: 900805-8

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	143	121	150	141	148	148	145	155	139	153
pH	pH Units	8.16	7.57	6.02	7.08	6.82	7.01	7.60	7.05	6.99	7.12
Conductivity	umohs/cm	158	242	263	181	167	92	115	97	95	87
Sulfate	mg/L	24	73	96	48	42	25	20	13	<10	11
Cumulative Sulfate	Total mg	3	12	27	33	40	43	46	48	48	50
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	6	6	6	6	6	6	6

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ENSR CONSULTING & ENGINEERING
August 31, 1990

CLIENT SAMPLE I.D.: B-11/0739-008-203
LAB SAMPLE I.D.: 900805-9

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	138	158	165	137	145	147	148	150	147	155
pH	pH Units	4.83	3.93	3.61	3.74	3.64	3.71	3.75	3.65	3.64	3.56
Conductivity	umohs/cm	574	855	919	920	819	636	575	417	410	483
Sulfate	mg/L	253	405	440	464	374	254	273	183	165	207
Cumulative Sulfate	Total mg	35	99	172	235	289	327	367	394	419	451
Acidity	mg/L CaCO3	82	228	292	215	190	137	125	93	88	102
Cumulative Acidity	Tot. mg CaCO3	11	47	96	125	153	173	191	205	218	234
Iron (Diss.)	mg/L	29	56	58	47	45	29	27	15.4	15.0	65
Cumulative Iron	Total ug	4002	12850	22420	28859	35384	39647	43643	45953	48158	58233

CLIENT SAMPLE I.D.: B-12/0739-008-203
LAB SAMPLE I.D.: 900805-10

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	116	145	171	115	164	173	146	155	160	166
pH	pH Units	8.08	7.89	6.07	6.69	6.73	7.02	7.65	7.21	7.11	7.75
Conductivity	umohs/cm	128	97	103	158	75	56	82	63	70	64
Sulfate	mg/L	<10	<10	<10	18	<10	<10	<10	<10	<10	<10
Cumulative Sulfate	Total mg	0	0	0	2	2	2	2	2	2	2
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	0.34	<0.03	0.03	0.04	0.10	<0.03	0.12	0.04	<0.03	0.22
Cumulative Iron	Total ug	39	39	45	49	66	66	83	89	89	126

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ENSR CONSULTING & ENGINEERING
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CLIENT SAMPLE I.D.: B-13/0739-008-203
LAB SAMPLE I.D.: 900805-11

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	146	147	145	142	144	145	146	146	141	151
pH	pH Units	5.59	5.08	5.25	5.03	5.18	4.95	4.84	5.00	5.02	4.76
Conductivity	umohs/cm	325	437	397	280	236	168	163	134	90	133
Sulfate	mg/L	129	198	168	115	95	59	67	55	34	48
Cumulative Sulfate	Total mg	19	48	72	89	102	111	121	129	133	141
Acidity	mg/L CaCO3	24	41	49	50	53	29	38	31	15	21
Cumulative Acidity	Tot. mg CaCO3	4	10	17	24	31	36	41	46	48	51
Iron (Diss.)	mg/L	6.00	1.57	0.63	0.32	0.41	0.47	0.45	0.30	0.34	0.79
Cumulative Iron	Total ug	876	1107	1198	1244	1303	1371	1436	1480	1528	1648

CLIENT SAMPLE I.D.: B-14/0739-008-203
LAB SAMPLE I.D.: 900805-12

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	144	183	184	139	143	145	142	140	141	145
pH	pH Units	7.87	7.65	6.34	6.34	6.28	6.71	6.79	6.86	6.76	7.43
Conductivity	umohs/cm	162	178	167	224	153	107	102	88	81	64
Sulfate	mg/L	40	57	49	72	42	22	20	14	<10	10
Cumulative Sulfate	Total mg	6	16	25	35	41	44	47	49	49	51
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	0	0	0	0	0	0	0

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CLIENT SAMPLE I.D.: WR-1P/0739-008-203
LAB SAMPLE I.D.: 900805-13

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	136	146	151	136	148	144	144	142	135	142
pH	pH Units	7.93	7.53	5.88	6.28	6.44	6.72	6.84	6.83	6.62	6.24
Conductivity	umohs/cm	588	830	593	673	597	465	488	408	280	336
Sulfate	mg/L	227	417	250	292	250	204	212	172	98	131
Cumulative Sulfate	Total mg	31	92	130	169	206	236	266	291	304	322
Acidity	mg/L CaCO3	<10	<10	16	<10	16	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	2	2	5	5	5	5	5	5
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	0	0	0	0	9	9	9

CLIENT SAMPLE I.D.: WR-2P/0739-008-203
LAB SAMPLE I.D.: 900805-14

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	126	112	148	133	124	101	152	147	147	150
pH	pH Units	7.78	7.67	6.26	6.31	6.68	6.65	6.61	6.82	6.53	6.21
Conductivity	umohs/cm	1010	1020	1110	1060	790	640	910	643	648	601
Sulfate	mg/L	430	504	500	500	360	282	447	285	288	275
Cumulative Sulfate	Total mg	54	111	185	251	296	324	392	434	476	518
Acidity	mg/L CaCO3	<10	34	101	32	36	30	71	24	29	24
Cumulative Acidity	Tot. mg CaCO3	0	4	19	23	27	31	41	45	49	53
Iron (Diss.)	mg/L	1.11	<0.03	0.12	<0.03	<0.03	<0.03	<0.03	<0.03	0.10	<0.03
Cumulative Iron	Total ug	140	140	158	158	158	158	158	158	172	172

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CLIENT SAMPLE I.D.: WR-3P/0739-008-203
LAB SAMPLE I.D.: 900805-15

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	148	140	140	133	142	141	139	137	135	144
pH	pH Units	8.42	7.78	5.96	6.98	6.73	6.95	7.32	7.37	7.10	7.46
Conductivity	umohs/cm	109	185	182	150	104	78	104	111	89	75
Sulfate	mg/L	12	48	43	<10	13	<10	13	<10	<10	<10
Cumulative Sulfate	Total mg	2	8	15	15	16	16	18	18	18	18
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	0	0	0	0	0	0	0

CLIENT SAMPLE I.D.: WR-4P/0739-008-203
LAB SAMPLE I.D.: 900805-16

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	139	136	139	132	140	140	137	138	134	139
pH	pH Units	7.95	7.66	5.91	6.96	6.65	7.07	7.15	7.10	7.06	7.21
Conductivity	umohs/cm	113	196	206	152	114	80	114	97	92	74
Sulfate	mg/L	15	58	57	<10	20	<10	17	<10	<10	<10
Cumulative Sulfate	Total mg	2	10	18	18	21	21	23	23	23	23
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	<0.03	<0.03	<0.03	0.19	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	0	0	0	25	29	29	29	29	29	29

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ENSR CONSULTING & ENGINEERING
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CLIENT SAMPLE I.D.: WR-5P/0739-008-203
LAB SAMPLE I.D.: 900805-17

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	125	126	132	119	127	127	131	120	125	131
pH	pH Units	6.23	6.84	5.69	6.30	6.20	6.36	6.17	6.68	6.38	6.23
Conductivity	umohs/cm	1030	1300	1270	1310	1130	1020	893	905	929	1000
Sulfate	mg/L	494	745	655	682	550	490	468	476	482	528
Cumulative Sulfate	Total mg	62	156	242	323	393	455	517	574	634	703
Acidity	mg/L CaCO3	14	60	148	93	81	46	44	<10	<10	14
Cumulative Acidity	Tot. mg CaCO3	2	9	29	40	50	56	62	62	62	64
Iron (Diss.)	mg/L	7.50	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03
Cumulative Iron	Total ug	938	938	943	943	943	943	943	943	943	947

CLIENT SAMPLE I.D.: WR-6P/0739-008-203
LAB SAMPLE I.D.: 900805-18

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	148	148	149	136	146	151	149	146	135	150
pH	pH Units	5.68	5.10	5.58	6.03	5.88	6.15	6.29	6.24	5.71	5.85
Conductivity	umohs/cm	268	543	439	281	216	151	158	112	105	98
Sulfate	mg/L	103	258	186	109	81	51	60	39	38	35
Cumulative Sulfate	Total mg	15	53	81	96	108	115	124	130	135	141
Acidity	mg/L CaCO3	11	36	34	13	15	10	14	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	2	7	12	14	16	17	20	20	20	20
Iron (Diss.)	mg/L	3.26	1.21	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	482	662	662	662	662	662	662	662	662	662

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ENSR CONSULTING & ENGINEERING
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CLIENT SAMPLE I.D.: WR-7P/0739-008-203
LAB SAMPLE I.D.: 900805-19

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	124	130	139	131	134	132	138	136	123	129
pH	pH Units	7.13	7.03	5.84	6.29	6.03	6.42	6.50	6.73	6.28	6.27
Conductivity	umohs/cm	1490	880	876	942	498	514	455	391	348	275
Sulfate	mg/L	808	444	450	478	224	226	206	172	142	110
Cumulative Sulfate	Total mg	100	158	220	283	313	343	371	395	412	426
Acidity	mg/L CaCO3	<10	<10	15	<10	10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	2	2	3	3	3	3	3	3
Iron (Diss.)	mg/L	0.03	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	4	4	4	4	4	12	12	12	12	12

CLIENT SAMPLE I.D.: WR-8P/0739-008-203
LAB SAMPLE I.D.: 900805-20

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	129	130	137	136	137	137	142	137	136	143
pH	pH Units	3.10	3.29	3.40	3.26	3.31	3.30	3.39	3.34	3.33	3.26
Conductivity	umohs/cm	1420	1330	1270	1350	997	1070	959	923	891	790
Sulfate	mg/L	718	680	665	756	454	460	577	495	452	386
Cumulative Sulfate	Total mg	93	181	272	375	437	500	582	650	711	767
Acidity	mg/L CaCO3	254	317	365	287	191	203	186	201	156	167
Cumulative Acidity	Tot. mg CaCO3	33	74	124	163	189	217	243	271	292	316
Iron (Diss.)	mg/L	64	99	88	67	43	42	32	28	26	26
Cumulative Iron	Total ug	8256	21126	33182	42294	48185	53939	58483	62319	65855	69573

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CLIENT SAMPLE I.D.: WR-9P/0739-008-203
LAB SAMPLE I.D.: 900805-21

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	134	130	130	135	139	141	151	144	143	144
pH	pH Units	4.72	4.73	5.13	5.01	5.34	5.06	5.11	5.51	5.12	5.41
Conductivity	umohs/cm	221	355	340	784	168	117	81	86	65	64
Sulfate	mg/L	78	141	140	113	58	40	29	32	22	20
Cumulative Sulfate	Total mg	10	29	47	62	70	76	80	85	88	91
Acidity	mg/L CaCO3	16	12	16	15	<10	14	<10	14	<10	11
Cumulative Acidity	Tot. mg CaCO3	2	4	6	8	8	10	10	12	12	13
Iron (Diss.)	mg/L	0.67	<0.03	0.04	0.06	<0.03	0.06	<0.03	<0.03	<0.03	<0.03
Cumulative Iron	Total ug	90	90	95	103	103	112	112	112	112	112

CLIENT SAMPLE I.D.: WR-10P/0739-008-203
LAB SAMPLE I.D.: 900805-22

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	141	153	162	145	152	146	147	146	147	152
pH	pH Units	4.69	4.41	4.33	4.02	4.02	4.03	4.21	4.11	4.12	4.10
Conductivity	umohs/cm	245	747	681	688	469	495	419	367	300	319
Sulfate	mg/L	96	351	328	346	190	183	196	170	128	120
Cumulative Sulfate	Total mg	14	67	120	171	199	226	255	280	299	317
Acidity	mg/L CaCO3	13	26	33	54	25	30	31	36	25	35
Cumulative Acidity	Tot. mg CaCO3	2	6	11	19	23	27	32	37	41	46
Iron (Diss.)	mg/L	0.91	0.58	1.06	2.50	1.52	1.21	0.79	1.26	0.75	1.35
Cumulative Iron	Total ug	128	217	389	751	982	1159	1275	1459	1569	1775

The analyses, opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed represent the best judgement of Core Laboratories. Core Laboratories assumes no responsibility and makes no warranty or representations, express or implied, as to the productivity, proper operations, or profitableness however of any oil, coal or material, well in connection with which such report is used or relied upon for any reason whatsoever.

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

SUMMARY OF DATA GENERATED FROM HUMIDITY CELL TESTING
ENSR CONSULTING & ENGINEERING
August 31, 1990

CLIENT SAMPLE I.D.: WR-12P/0739-008-203
LAB SAMPLE I.D.: 900805-23

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	147	155	157	140	156	155	154	152	146	153
pH	pH Units	6.73	7.01	5.75	6.53	6.27	6.47	6.66	6.59	6.53	6.60
Conductivity	umohs/cm	28	72	68	28	35	20	19	28	26	18
Sulfate	mg/L	<10	20	10	<10	<10	<10	<10	<10	<10	<10
Cumulative Sulfate	Total mg	0	3	5	5	5	5	5	5	5	5
Acidity	mg/L CaCO3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	0	0	0	0	0	0	0	0	0	0
Iron (Diss.)	mg/L	0.04	0.03	0.22	0.06	0.43	0.11	0.11	0.23	0.11	0.12
Cumulative Iron	Total ug	6	11	45	53	121	138	155	190	206	224

CLIENT SAMPLE I.D.: WR-13P/0739-008-203
LAB SAMPLE I.D.: 900805-24

PARAMETER	UNITS	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Leachate Quantity	mls	156	160	160	156	157	157	157	163	156	160
pH	pH Units	4.90	4.63	5.23	4.96	5.12	5.71	5.06	5.25	4.70	5.73
Conductivity	umohs/cm	171	319	182	140	88	75	67	57	64	70
Sulfate	mg/L	64	126	77	52	30	27	24	21	23	23
Cumulative Sulfate	Total mg	10	30	42	51	55	60	63	67	70	74
Acidity	mg/L CaCO3	14	28	14	12	11	<10	12	<10	<10	<10
Cumulative Acidity	Tot. mg CaCO3	2	7	9	11	13	13	14	14	14	14
Iron (Diss.)	mg/L	3.15	8.8	1.24	0.27	0.10	0.12	0.06	0.03	0.05	0.05
Cumulative Iron	Total ug	491	1899	2098	2140	2156	2174	2184	2189	2197	2205

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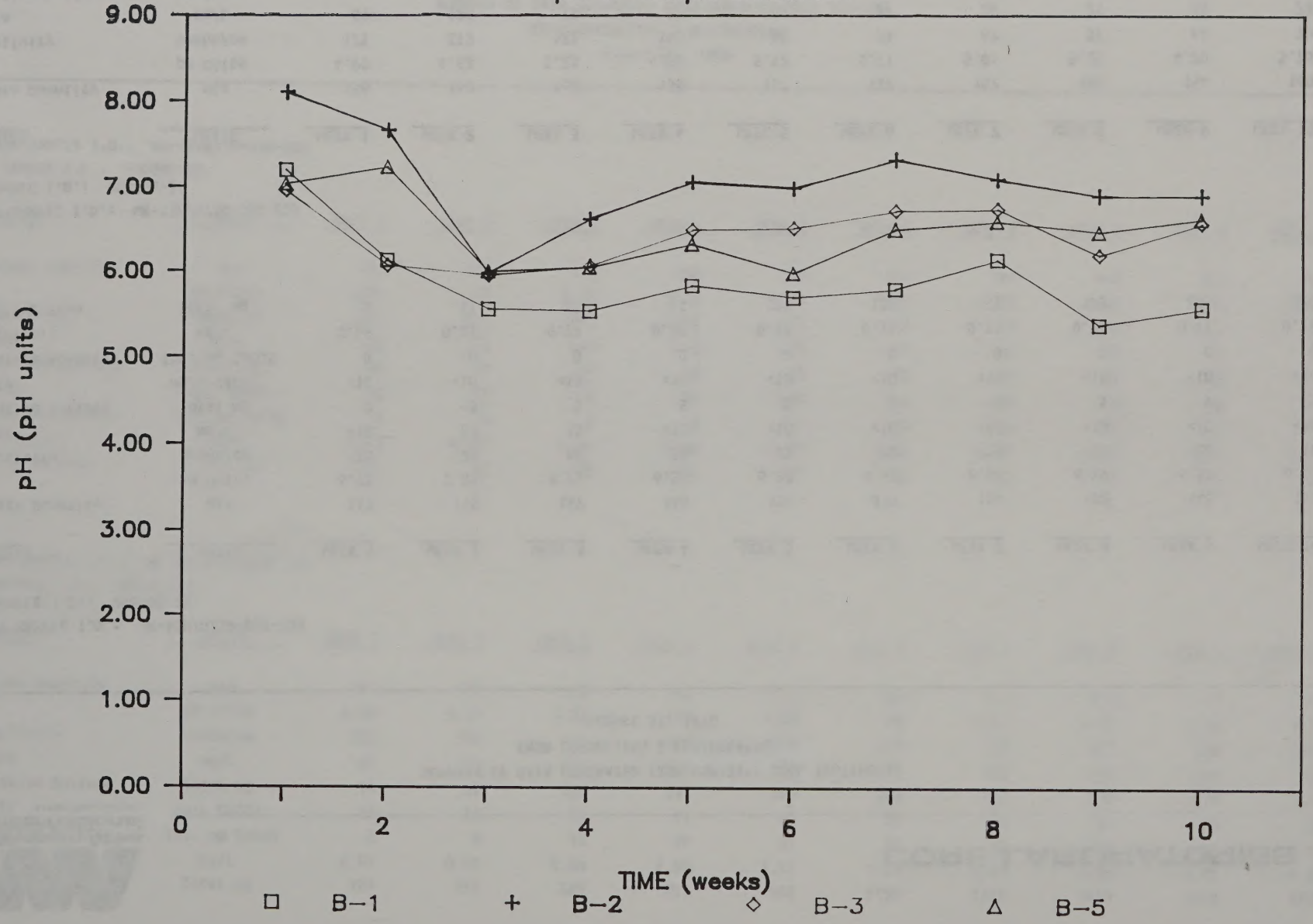
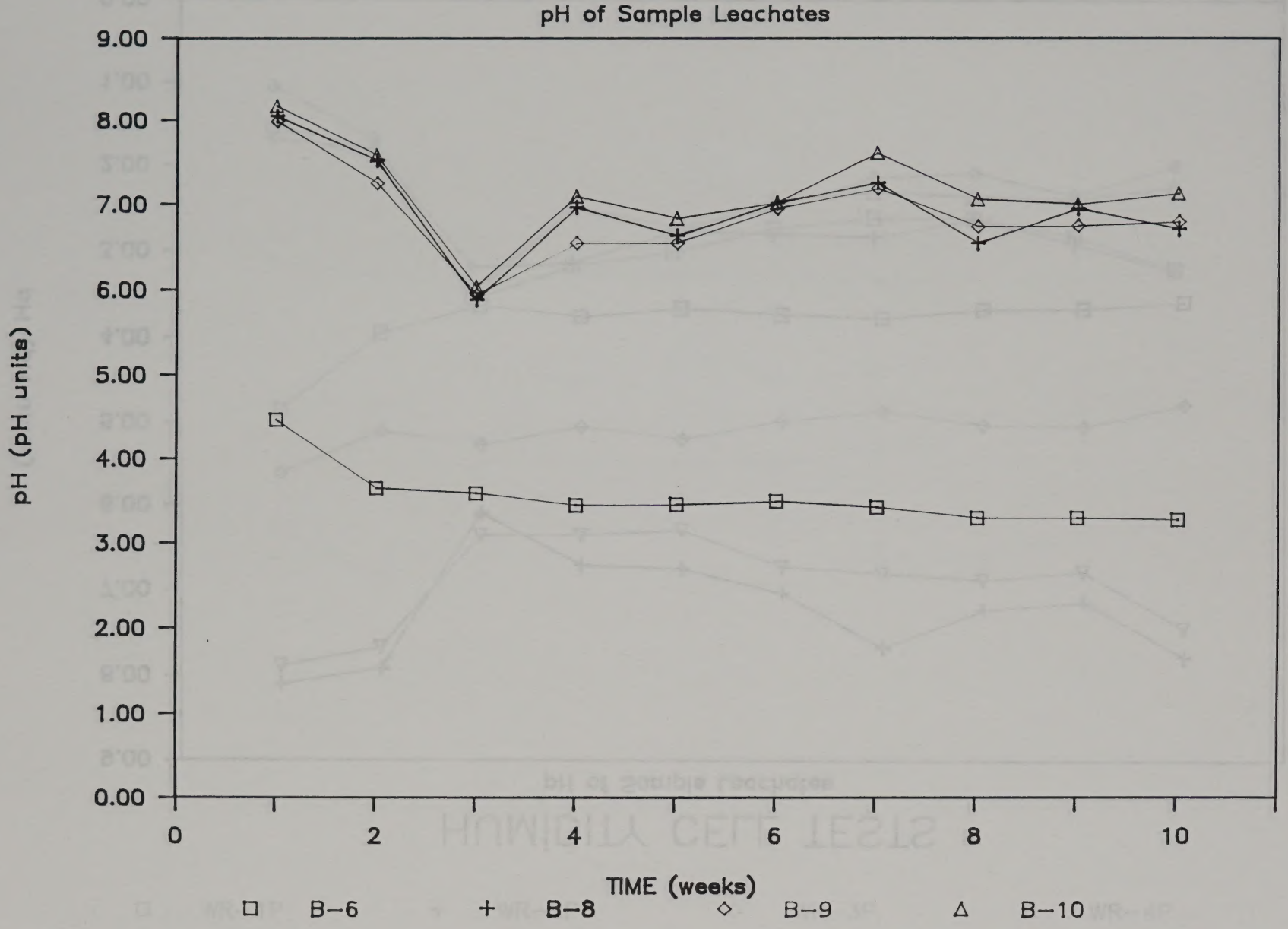
HUMIDITY CELL TESTS

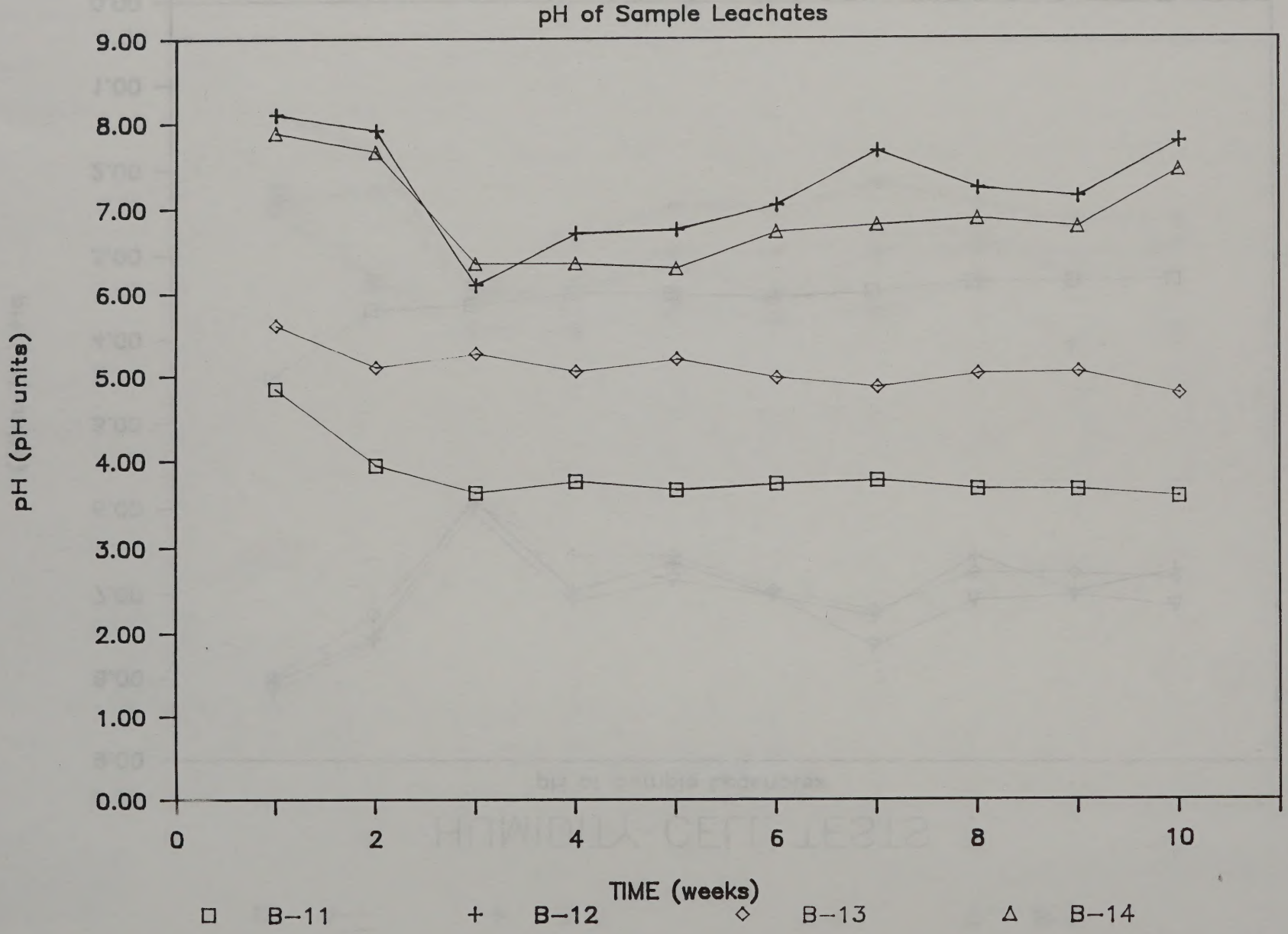
pH of Sample Leachates



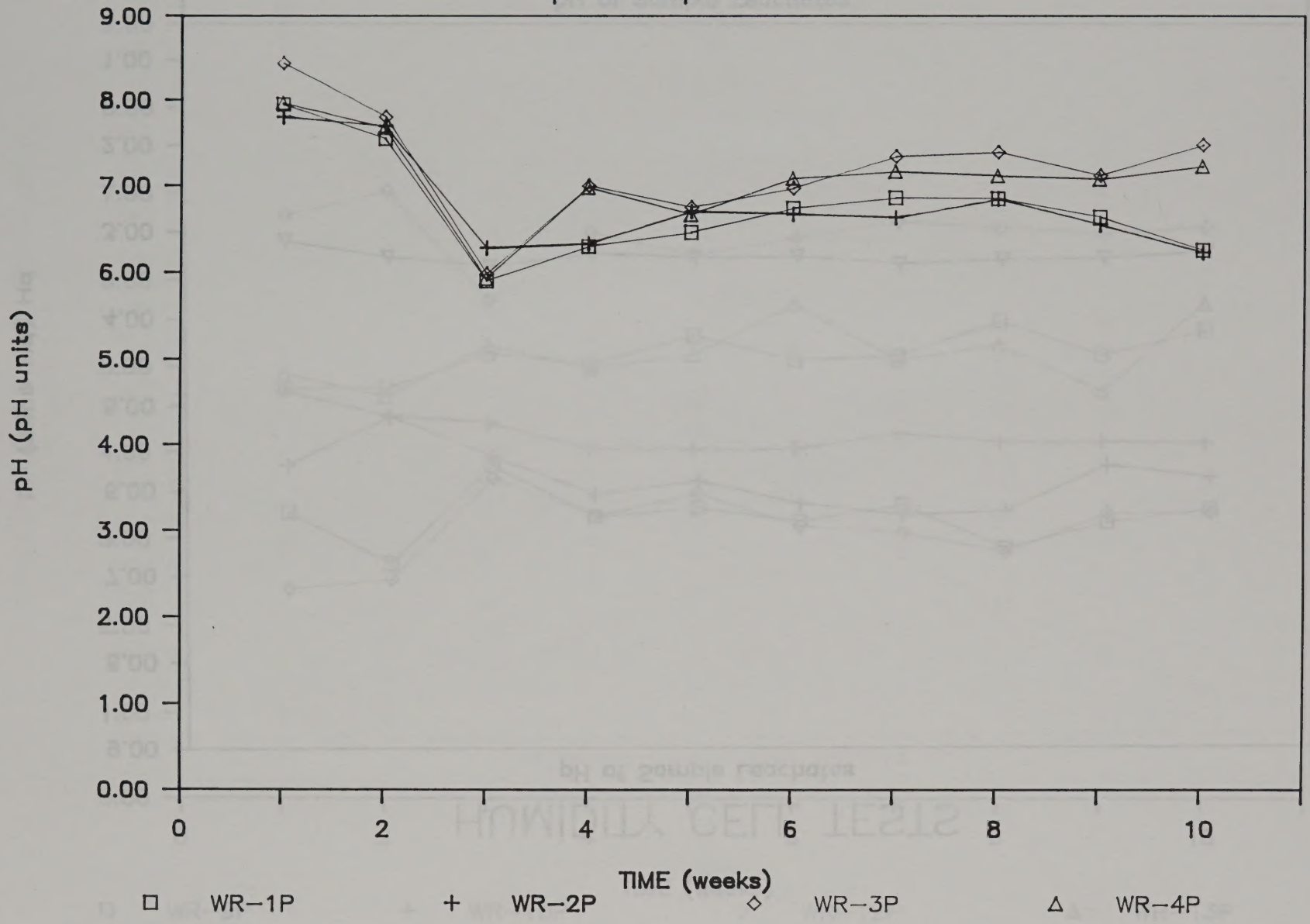
HUMIDITY CELL TESTS



HUMIDITY CELL TESTS

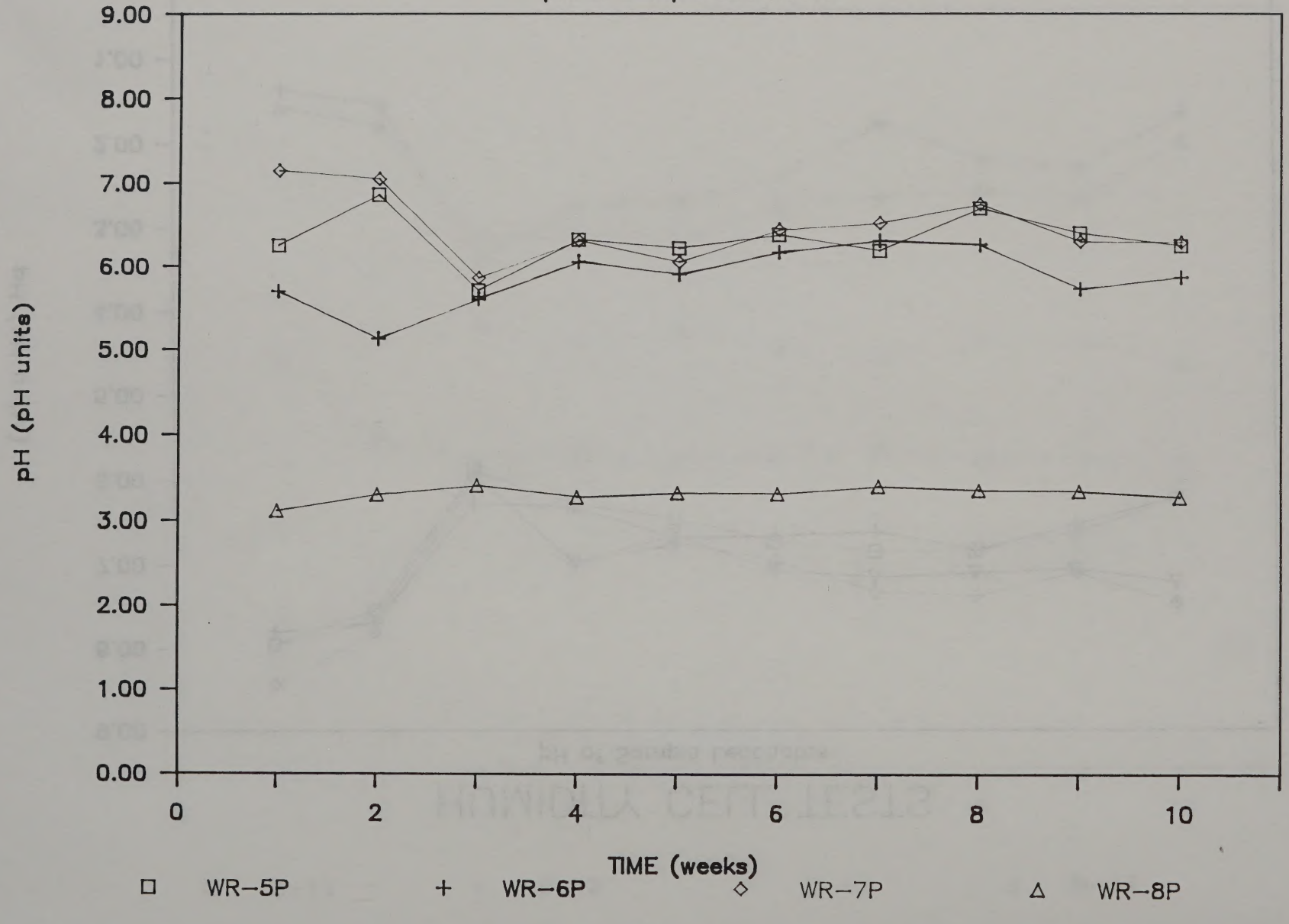


HUMIDITY CELL TESTS

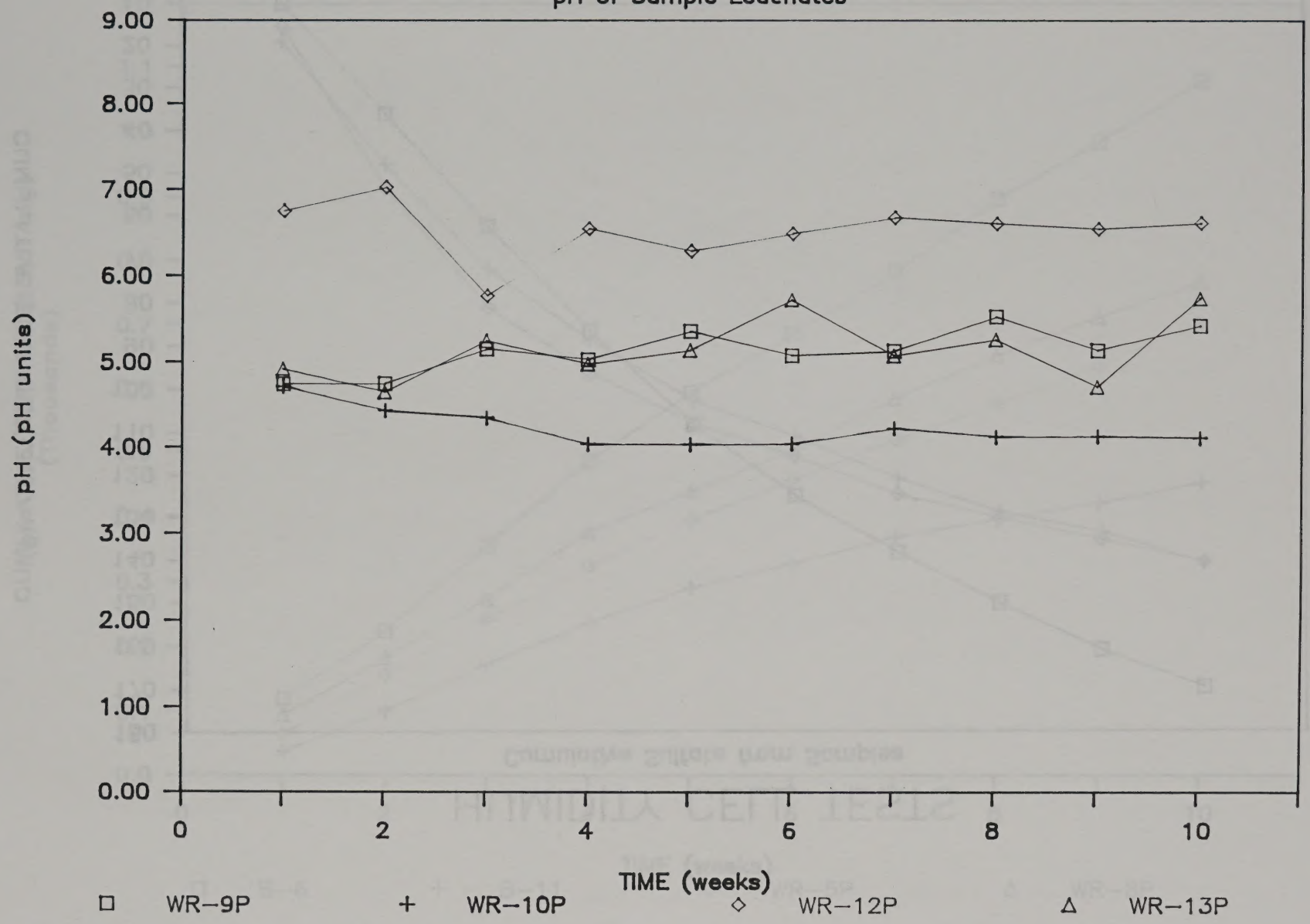


HUMIDITY CELL TESTS

pH of Sample Leachates



HUMIDITY CELL TESTS



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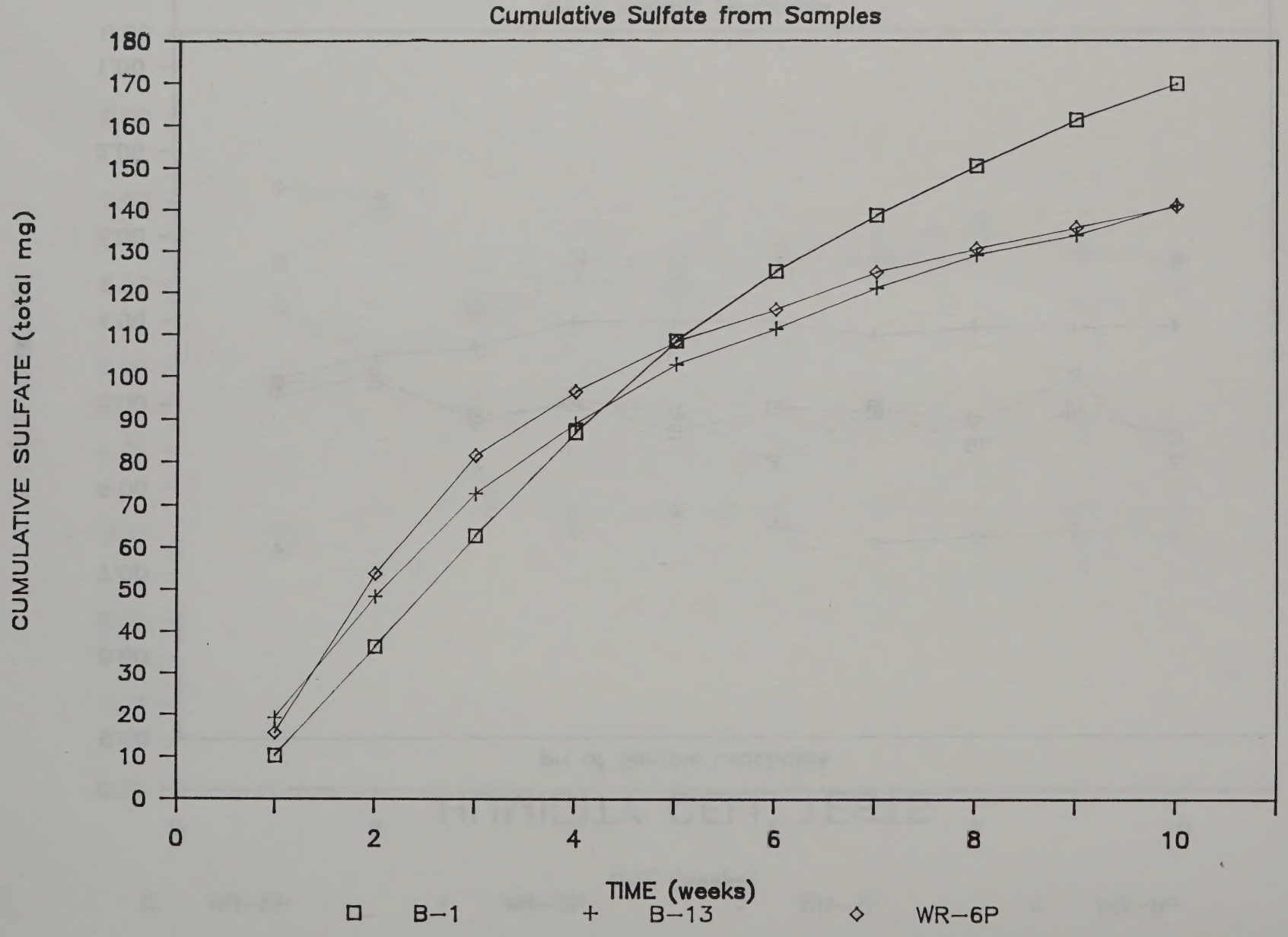
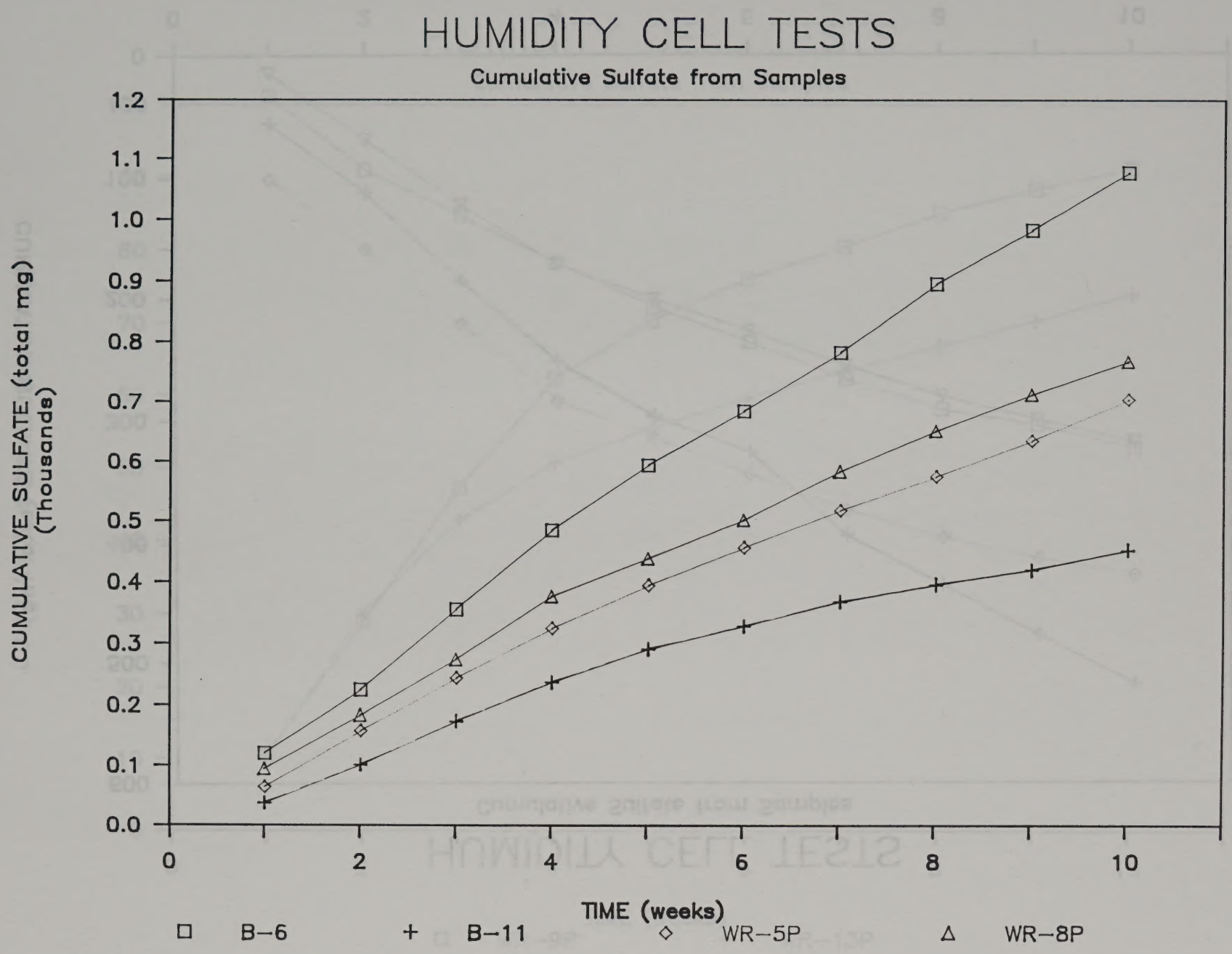
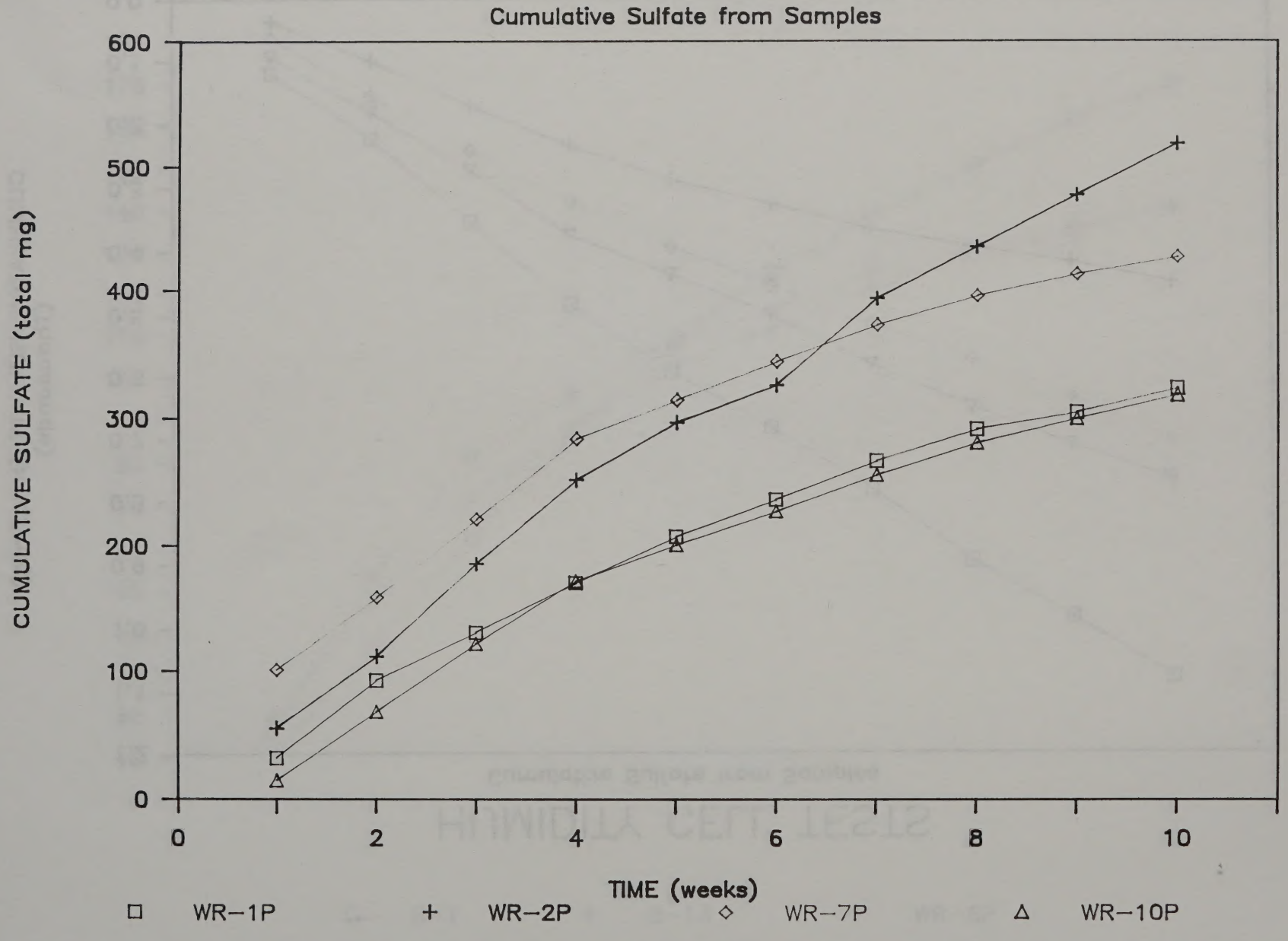
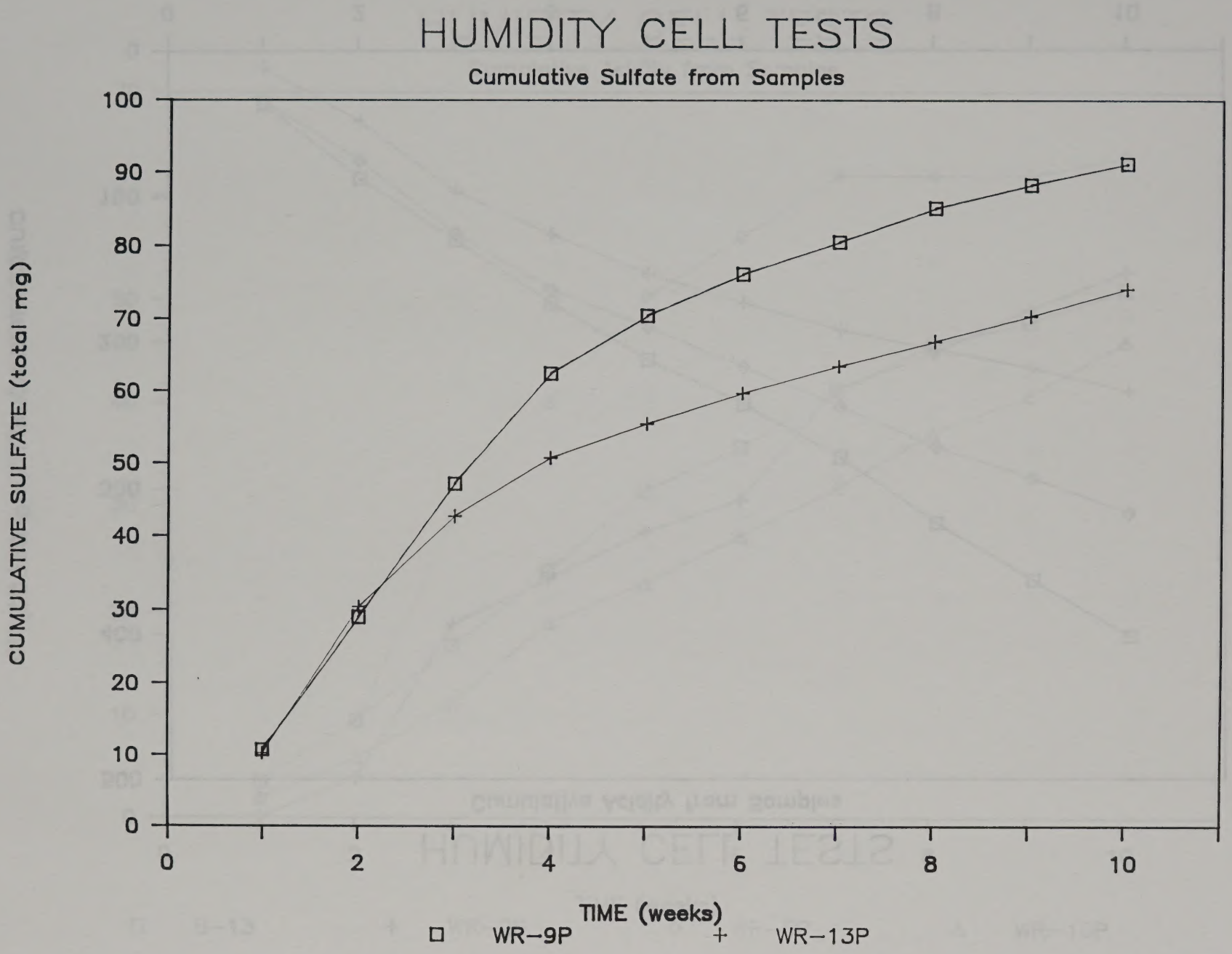


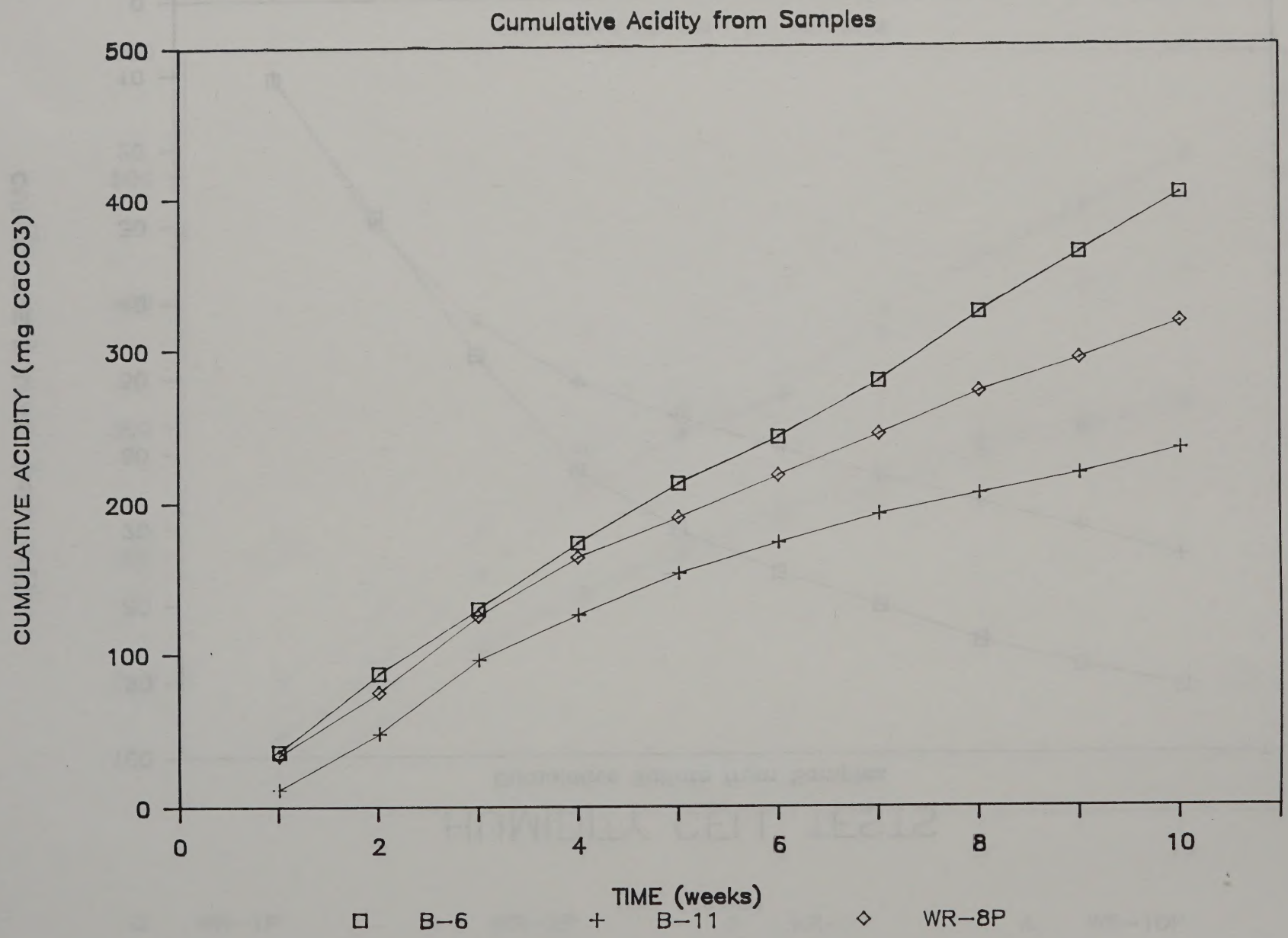

HUMIDITY CELL TESTS
Cumulative Sulfate from Samples
CUMULATIVE SULFATE (total mg)
(Thousands)
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
2
4
6
8
10
TIME (weeks)
B-6
B-11
WR-5P
WR-8P

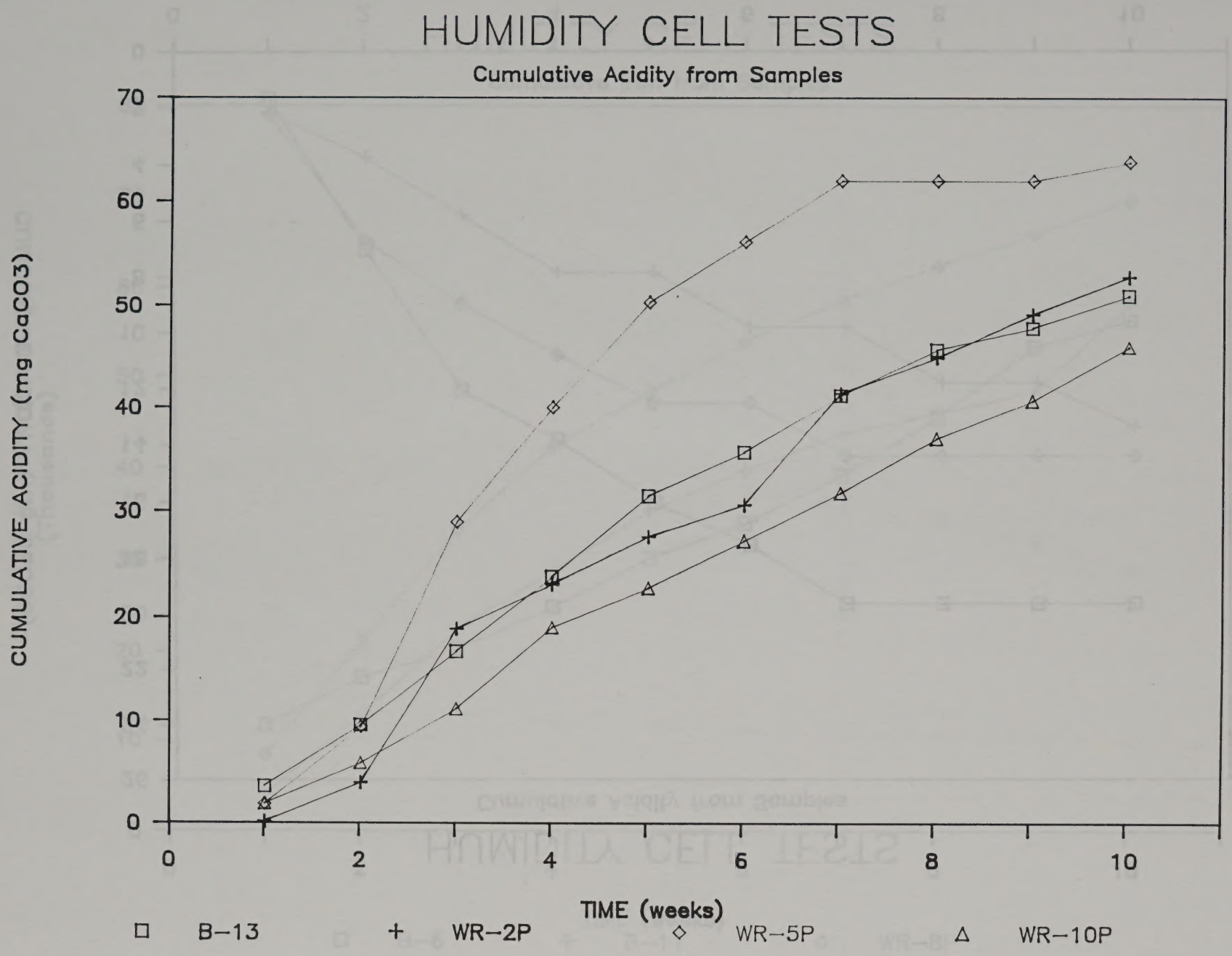
HUMIDITY CELL TESTS



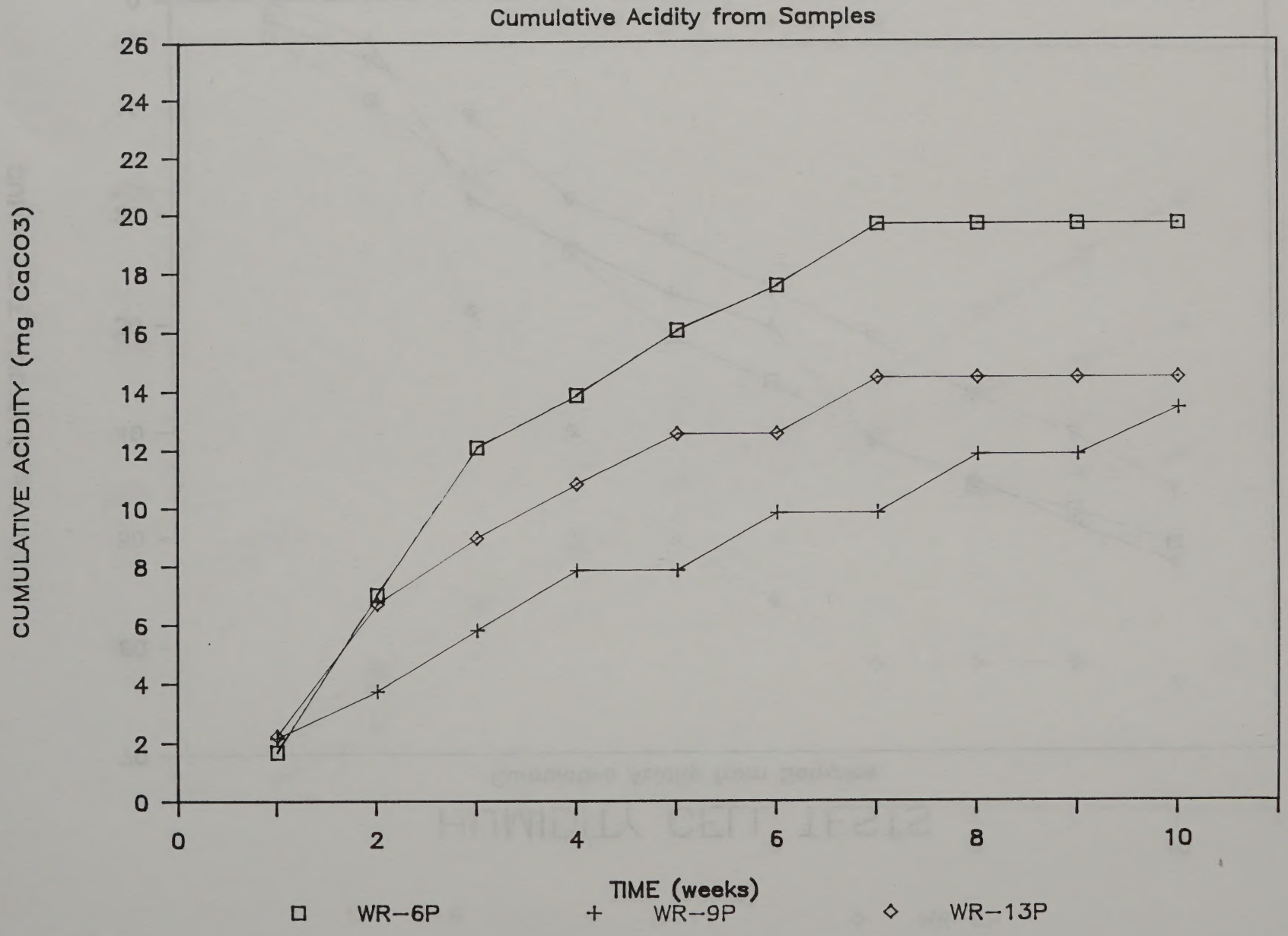

HUMIDITY CELL TESTS
Cumulative Sulfate from Samples
CUMULATIVE SULFATE (total mg)
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
TIME (weeks)
WR-9P
WR-13P

HUMIDITY CELL TESTS

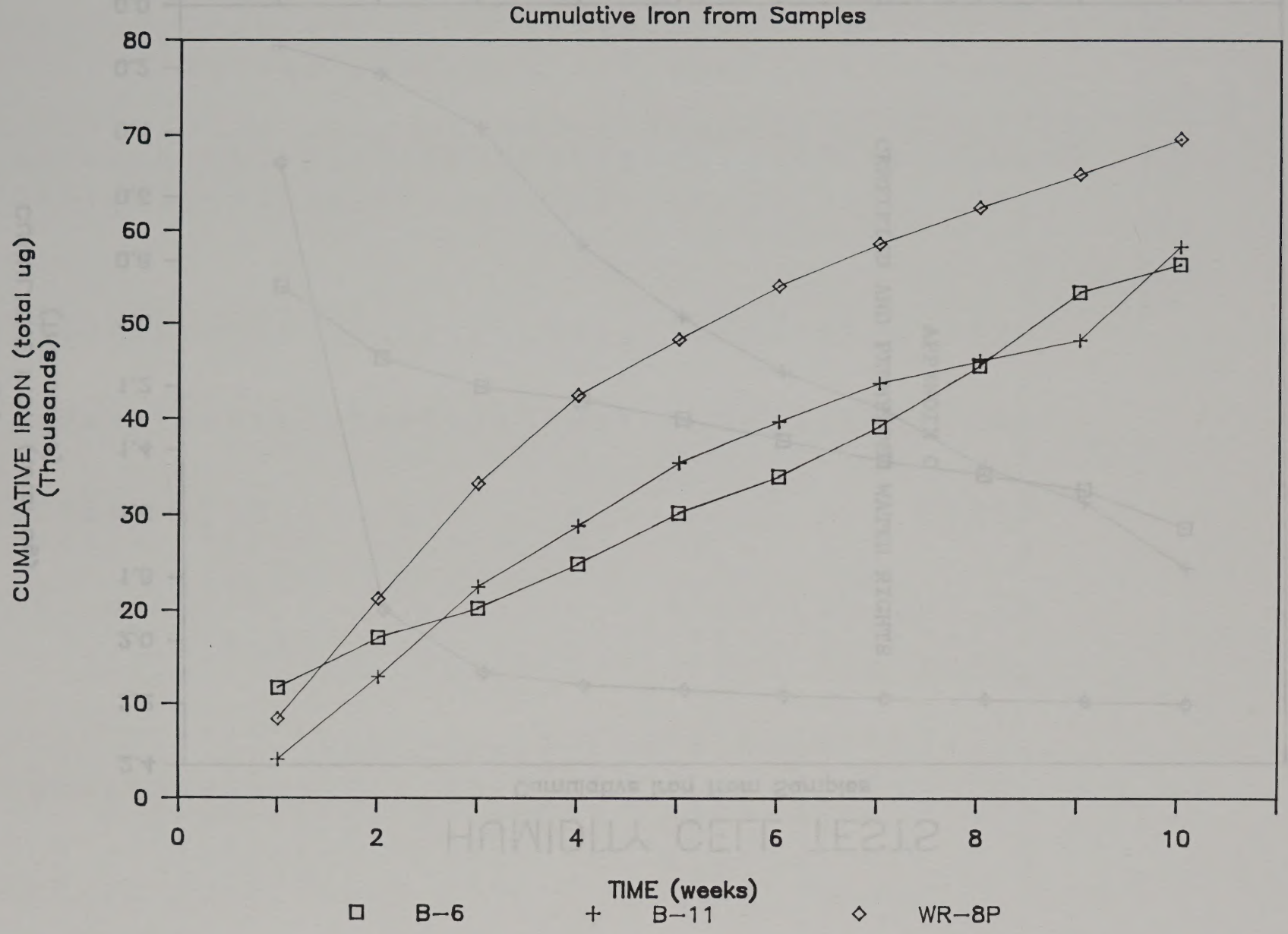



HUMIDITY CELL TESTS
Cumulative Acidity from Samples
CUMULATIVE ACIDITY (mg CaCO3)
70
60
50
40
30
20
10
0
0
2
4
6
8
10
TIME (weeks)
B-13
WR-2P
WR-5P
WR-10P

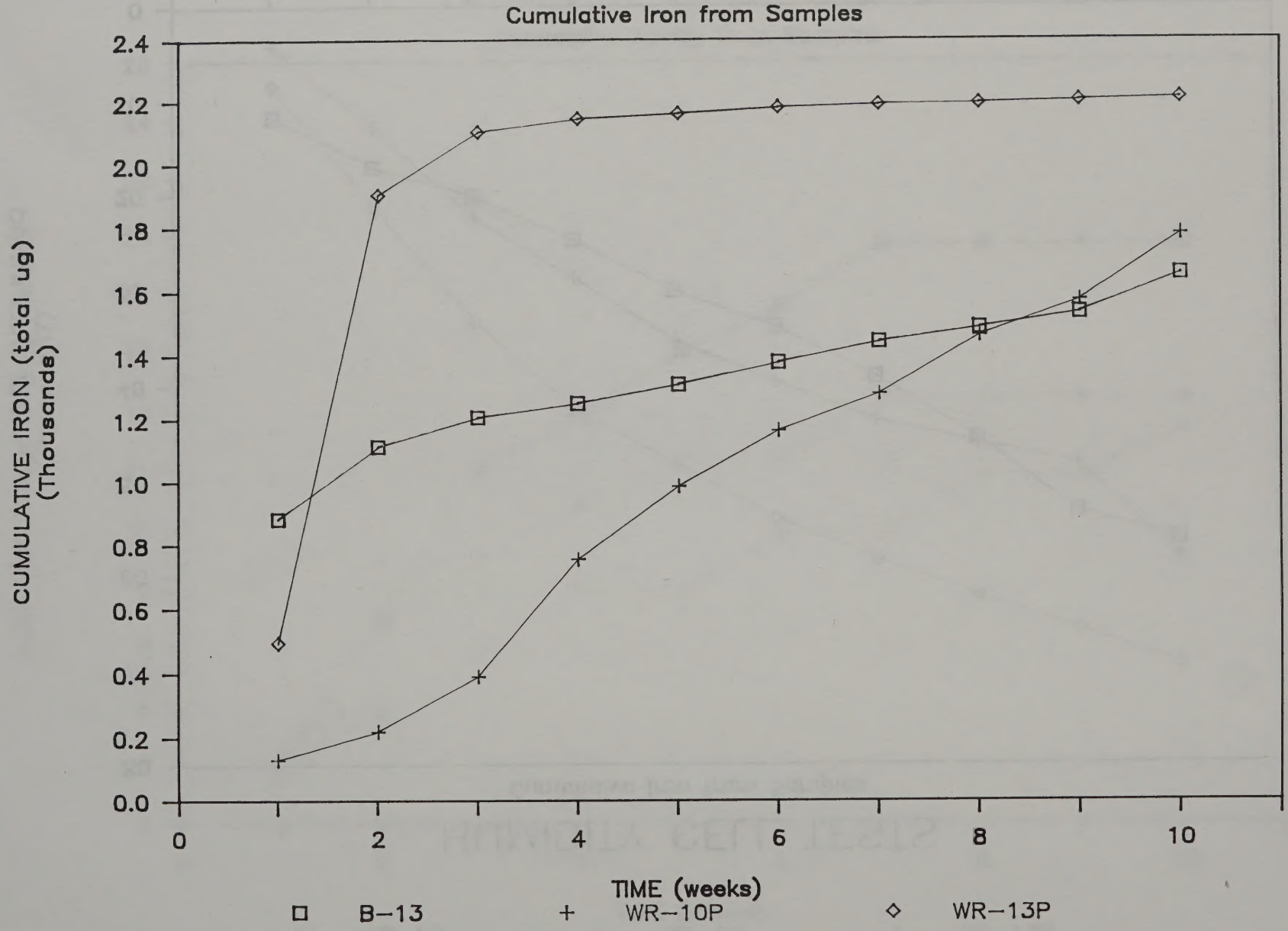
HUMIDITY CELL TESTS



HUMIDITY CELL TESTS



HUMIDITY CELL TESTS



APPENDIX C

CERTIFIED AND PERMITTED WATER RIGHTS

APPENDIX C

CERTIFIED AND PERMITTED WATER RIGHTS
IN BOULDER VALLEY HYDROGRAPHIC AREA ON
COMPUTER FILE WITH NEVADA STATE ENGINEER

POINT OF DIVERSION

STAT	CERT #	SRC	Q	Q	SEC	TWP	RNG	DIV RATE CFS	TYPE OF USE	ACRES IRR	ANNUAL DUTY	OWNER OF RECORD
CER	1903	STR	SE	NE	18	33N	50E	1.250	IRR	124.96	455.00 AFS	THORNTON. ASH
CER	11160	STR	SW	SW	15	36N	49E	0.000	IRR	360.00	0.00 AFS	PACHER, RHOADS
CER	11162	STR	NE	NE	8	35N	49E	0.128	IRR	120.57	53.00 AFS	FOX
CER	11163	STR	SE	SW	8	35N	49E	1.286	IRR	144.25	139.44 AFS	FOX
CER	1913	SPR	NW	NW	18	33N	50E	0.025	DOM		0.00 *	WEBER
CER	1624	SPR	NE	NE	14	32N	50E	0.025	DOM		5.9 MGA	PRIMEAUX
CER	2517	SPR	SW	SE	12	32N	50E	0.006	DOM		1.42 MGA	LEWIS
CER	4872	UG	SE	SE	25	33N	48E	6.087	IRR	312.99	938.97 AFS	MARVEL, MARVEL
CER	4458	SPR	NE	NE	14	32N	50E	0.007	DOM		0.00 *	TRANSPORTATION DEPT
CER	5605	UG	NE	NW	5	34N	49E	3.500	IRR	170.48	681.92 AFA	ELKO LAND & LIVESTOCK
CER	5606	UG	NE	NE	6	34N	49E	3.500	IRR	148.00	592.00 AFA	ELKO LAND & LIVESTOCK
CER	5729	UG	NE	NW	11	36N	49E	0.111	MM		80.66 AFS	NEWMONT GOLD COMPANY
CER	6214	UG	NW	SW	24	33N	48E	5.998	IRR	361.20	1444.80 AFA	MARVEL, MARVEL
CER	7306	UG	NW	NE	26	33N	48E	0.334	MM		241.97 AFS	NATIONAL LEAD CO.
CER	7018	UG	LT	1	20	35N	50E	1.025	MM		0.00	NEWMONT GOLD CO.
CER	6682	UG	NW	NW	22	35N	50E	1.000	MM		241.32 AFS	NEWMONT GOLD CO.
CER	7642	UG	NW	NW	22	35N	50E	0.045	STK		5.09 AFS	NEWMONT GOLD CO.
CER	8461	UG	NE	NE	23	33N	48E	3.686	IRR	253.50	760.50 AFA	DUNPHY RANCH
CER	8778	UG	LT	1	4	35N	50E	0.056	MM		20.56 AFS	NEWMONT GOLD CO.
CER	9940	UG	NE	SE	10	36N	49E	1.000	MM		199.49 AFS	NEWMONT GOLD CO.
CER	8659	UG	LT	1	20	35N	50E	0.025	STK		12.03 AFS	ELKO LAND & LIVESTOCK
CER	8973	UG	SE	SW	26	33N	49E	0.006	STK		3.93 AFS	ELKO LAND & LIVESTOCK
CER	8972	UG	SW	NE	28	35N	49E	0.008	STK		3.93 AFS	ELKO LAND & LIVESTOCK
CER	10722	UG	NW	SE	30	36N	50E	0.140	MM		96.80 AFS	POLAR RESOURCES CO.
CER	10226	UG	SE	NE	7	34N	49E	0.600	IRR	254.47	1017.88 AFS	ELKO LAND & LIVESTOCK
CER	10227	UG	SE	NW	8	34N	49E	5.106	IRR	255.36	1021.44 AFS	ELKO LAND & LIVESTOCK
CER	9282	UG	NW	SE	30	36N	50E	0.009	STK		6.72 AFS	ELKO LAND & LIVESTOCK
CER	10228	UG	LT	4	19	34N	50E	0.012	STK		17.92 AFS	ELKO LAND & LIVESTOCK
CER	10043	UG	SW	NW	2	33N	49E	5.124	IRR	2,495.29	2794.25 AFS	ELKO LAND & LIVESTOCK
CER	10044	UG	SE	NW	3	33N	49E	4.902	IRR	2,495.29	2673.19 AFS	ELKO LAND & LIVESTOCK
CER	10046	UG	SW	NW	3	33N	49E	4.233	IRR	3,123.69	2308.35 AFS	ELKO LAND & LIVESTOCK
CER	10047	UG	SW	NW	1	33N	49E	5.793	IRR	3123.69	3159.06 AFS	ELKO LAND & LIVESTOCK
CER	10048	UG	SW	NE	2	33N	49E	5.347	IRR	3123.69	2915.85 AFS	ELKO LAND & LIVESTOCK
CER	10229	UG	SE	NE	7	34N	49E	4.524	IRR	254.47	1017.88 AFS	ELKO LAND & LIVESTOCK
CER	10865	UG	SW	SE	10	35N	50E	0.160	MM		64.27 AFS	POLAR RESOURCES CO.
PER		UG	NE	NW	17	34N	49E	8.000	IRR	640.00	2560.00 AFA	ELKO LAND & LIVESTOCK
PER		UG	NE	SW	4	34N	49E	8.000	IRR	640.00	2560.00 AFA	ELKO LAND & LIVESTOCK
PER		UG	NE	SW	28	32N	49E	0.000	IRR	3185.00	0.00 AFS	ZEDA CORP.
PER		UG	SW	SW	2	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK
PER		UG	SW	SE	2	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK
PER		UG	SW	SE	3	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK
PER		UG	SE	NW	1	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK
PER		UG	SW	SW	3	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK
PER		UG	SW	NE	10	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK
PER		UG	SW	NW	11	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK
PER		UG	SW	NW	10	33N	49E	6.000	IRR	5222.48	4342.77 AFA	ELKO LAND & LIVESTOCK

PER		UG	SW	NE	23	34N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NE	SE	29	35N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NE	NE	29	35N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	SW	SE	23	34N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NE	SW	25	35N	48E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	SW	SW	25	34N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	SW	NW	25	34N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NE	NE	30	35N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NW	NW	24	34N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	SW	SW	24	34N	49E	0.000	IRR	2513.60	0.00 AFA ELKO LAND & LIVESTOCK
PER		UG	LT	3	4	34N	49E	5.400	IRR	640.00	2560.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NE	SW	17	34N	49E	8.000	IRR	640.00	2560.00 AFA ELKO LAND & LIVESTOCK
PER		UG	SE	NE	8	34N	49E	8.000	IRR	960.00	3840.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NE	NE	6	34N	49E	5.400	IRR	640.00	2560.00 AFA ELKO LAND & LIVESTOCK
PER		UG	NE	NW	5	34N	49E	6.000	IRR	640.00	2560.00 AFA ELKO LAND & LIVESTOCK
CER	10592	UG	NW	SE	30	36N	50E	0.233	MM		394.23 AFS BARRICK GOLDSTRIKE
CER	10875	UG	SW	SE	8	33N	49E	0.031	STK		22.40 AFS ELKO LAND & LIVESTOCK
CER	10876	UG	SE	NW	1	33N	48E	0.062	STK		44.81 AFS ELKO LAND & LIVESTOCK
PER		UG	SW	NW	1	33N	48E	0.062	STK		8.96 AFS ELKO LAND & LIVESTOCK
CER	12278	UG	LT	8	22	32N	49E	0.011	STK		13.57 AFS BLM - U.S.
PER		UG	NE	SW	24	36N	49E	0.000	MM		0.00 AFS BARRICK GOLDSTRIKE
PER		UG	SE	NW	12	36N	49E	1.000	MM		645.25 AFS EL CORDEX EXPLORATION
PER		UG	SE	SE	33	37N	49E	1.000	MM		645.25 AFS EL CORDEX EXPLORATION
PER		UG	SE	SW	3	36N	49E	1.000	MM		645.25 AFS EL CORDEX EXPLORATION
PER		UG	NW	NE	28	32N	49E	5.400	IRR	2895.00	2634.22 AFS ZEDA CORP.
PER		UG	NW	SW	28	32N	49E	5.400	IRR	3325.00	2634.22 AFS ZEDA CORP.
PER		UG	NE	SW	28	32N	49E	5.400	IRR	3185.00	2634.22 AFS ZEDA CORP.
PER		UG	SW	NW	29	36N	50E	0.750	MM		38.36 AFS BARRICK GOLDSTRIKE
CER	11919	UG	SE	NW	2	34N	49E	0.009	STK		6.51 AFS ELKO LAND & LIVESTOCK
CER	11928	UG	SE	NE	19	35N	49E	0.009	STK		6.51 AFS ELKO LAND & LIVESTOCK
CER	11938	UG	NE	NW	28	33N	47E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11937	UG	SE	NW	27	33N	47E	0.011	STK		7.95 AFS ELKO LAND & LIVESTOCK
CER	11921	UG	NW	SW	4	34N	49E	0.009	STK		6.51 AFS ELKO LAND & LIVESTOCK
CER	11939	UG	SW	NW	29	33N	47E	0.016	STK		11.57 AFS ELKO LAND & LIVESTOCK
CER	11917	UG	NE	NW	30	34N	49E	0.016	STK		11.57 AFS ELKO LAND & LIVESTOCK
CER	11940	UG	NE	SE	11	32N	49E	0.009	STK		6.51 AFS ELKO LAND & LIVESTOCK
CER	11927	UG	NE	NE	23	35N	49E	0.009	STK		6.51 AFS ELKO LAND & LIVESTOCK
CER	11920	UG	NE	SE	8	34N	49E	0.009	STK		6.51 AFS ELKO LAND & LIVESTOCK
PER	11929	UG	SE	NE	10	34N	50E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11941	UG	NE	SW	1	34N	48E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11934	UG	NW	SW	1	33N	47E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11933	UG	SW	SE	10	33N	47E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11915	UG	LT	4	5	33N	48E	0.011	STK		7.95 AFS ELKO LAND & LIVESTOCK
CER	11945	UG	NW	NW	21	34N	48E	0.011	STK		7.95 AFS ELKO LAND & LIVESTOCK
PER	11943	UG	SE	SE	34	35N	48E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11918	UG	SE	NW	34	34N	49E	0.016	STK		11.57 AFS ELKO LAND & LIVESTOCK
CER	11916	UG	NE	SE	16	34N	49E	0.009	STK		6.51 AFS ELKO LAND & LIVESTOCK
CER	11932	UG	SE	NE	14	33N	47E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11936	UG	SW	NE	21	33N	47E	0.011	STK		7.95 AFS ELKO LAND & LIVESTOCK
CER	11935	UG	SW	SE	17	33N	47E	0.013	STK		9.42 AFS ELKO LAND & LIVESTOCK
CER	11944	UG	NW	SW	15	33N	49E	0.016	STK		11.20 AFS ELKO LAND & LIVESTOCK
CER	11942	UG	SE	SE	34	34N	48E	0.011	STK		7.95 AFS ELKO LAND & LIVESTOCK
PER		UG	SE	NW	1	33N	48E	0.125	STK		89.62 AFS ELKO LAND & LIVESTOCK
PER		UG	SE	SE	33	37N	49E	0.000	MM		0.00 - EL CORDEX EXPLORATION
PER		UG	NW	NE	21	35N	50E	3.000	MM		1613.12 AFS NEWMONT GOLD CO.
PER		UG	NE	SE	31	36N	50E	0.500	MM		100.51 AFS NEWMONT GOLD CO.

PER	UG	NW	NE	39	36N	50E	0.000	MM		0.00 MGA	NEWMONT GOLD CO.
PER	UG	SE	SW	19	36N	50E	3.000	MM		153.45 AFS	BARRICK GOLDSTRIKE
PER	UG	NE	NW	25	36N	49E	0.750	MM		38.36 AFS	BARRICK GOLDSTRIKE
PER	UG	SW	SW	18	36N	50E	0.750	MM		38.36 AFS	BARRICK GOLDSTRIKE
PER	UG	SW	NE	19	36N	50E	0.750	MM		38.36 AFS	BARRICK GOLDSTRIKE
PER	UG	NE	NW	19	36N	50E	0.500	MM		40.21 AFS	NEWMONT GOLD CO.
PER	UG	NE	SW	29	36N	50E	1.000	MM		430.16 AFS	NEWMONT GOLD CO.
PER	UG	SW	SE	24	36N	49E	0.000	MM		0.00 -	BARRICK GOLDSTRIKE
PER	UG	NW	SW	32	36N	50E	1.000	MM		430.16 AFS	NEWMONT GOLD CO.
PER	UG	SW	NW	28	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	NE	SE	24	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	SW	SW	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	NE	NW	30	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	SE	SW	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	SE	SW	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	SE	SW	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	SE	SW	17	36N	50E	3.500	MM		752.79 AFS	NEWMONT GOLD CO.
PER	UG	SW	SW	34	36N	49E	1.000	MM		645.25 AFS	EL CORDEX EXPLORATION
PER	UG	SE	SE	29	36N	50E	0.500	MM		215.08 AFS	NEWMONT GOLD CO.
PER	UG	NW	SW	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	SE	SW	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	NW	NE	19	36N	50E	1.000	MM		215.08 AFS	NEWMONT GOLD CO.
PER	UG	SW	SE	18	36N	50E	1.000	MM		215.08 AFS	NEWMONT GOLD CO.
PER	UG	SE	NE	19	36N	50E	0.500	MM		107.54 AFS	NEWMONT GOLD CO.
PER	UG	NE	SE	29	36N	50E	0.500	MM		215.08 AFS	NEWMONT GOLD CO.
PER	UG	NE	SE	30	35N	49E	0.000	IRR	2513.60	0.00 -	ELKO LAND & LIVESTOCK
PER	UG	NE	NW	25	35N	48E	0.000	IRR	7600.00	0.00 -	ELKO LAND & LIVESTOCK
PER	UG	NE	NW	36	35N	48E	0.000	IRR	2513.60	0.00 -	ELKO LAND & LIVESTOCK
PER	UG	NE	SW	36	35N	48E	0.000	IRR	2513.60	0.00 -	ELKO LAND & LIVESTOCK
PER	UG	SW	NE	13	34N	49E	0.000	IRR	2513.60	0.00	ELKO LAND & LIVESTOCK
PER	UG	SW	NW	26	34N	49E	0.000	IRR	2513.60	0.00	ELKO LAND & LIVESTOCK
PER	UG	NE	NE	31	35N	49E	0.000	IRR	2513.60	0.00	ELKO LAND & LIVESTOCK
PER	UG	NW	SW	13	34N	49E	0.000	IRR	2513.60	0.00	ELKO LAND & LIVESTOCK
PER	UG	SW	SW	26	34N	49E	0.000	IRR	2513.60	0.00	ELKO LAND & LIVESTOCK
PER	UG	NE	SE	19	35N	49E	0.000	IRR	2513.60	0.00	ELKO LAND & LIVESTOCK
PER	UG	SE	SE	33	37N	49E	1.000	MM		645.25 AFS	EL CORDEX CORP.
PER	UG	SE	SW	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE
PER	UG	SW	SE	19	36N	50E	3.000	MM		2172.06 AFS	BARRICK GOLDSTRIKE

APPENDIX D

WATER QUALITY DATA

D-1 - Surface Water Database

BARRICK GOLDSTRIKE - SURFACE WATER DATABASE
ENSR PROJECT NUMBER: 0739-001-202
FILE NAME: SW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
BC-A	05/19/89			0.200 <	0.006				
BC-A	04/11/89	49.000	1.800	0.200 <	0.005 <	0.120	59.000	0.100 <	
BC-A	03/21/89			0.200 <	0.007				
BC-B	05/19/89				0.006				
BC-B	04/11/89	54.000	1.700	0.200 <	0.005	0.110	65.000	0.100 <	
Bell Creek	03/10/88	135	0.33	0.1 <	0.089	0.218	164	0.14 <	0.01
Brush Creek	09/13/89				0.005 <				
Brush Creek	08/17/89				0.005 <				
Brush Creek	07/17/89	180.000	0.100 <	0.200 <	0.005 <	0.090	210.000	0.100	
Brush Creek	06/27/89				0.005 <				
Brush Creek	05/17/89				0.005 <				
Brush Creek	04/12/89	110.000	0.800	0.200 <	0.005 <	0.060	140.000	0.100 <	
Brush Creek	03/21/89				0.005 <				
Brush Creek	02/17/89				0.005 <				
Brush Creek	01/04/89	190.000	0.100 <	0.200 <	0.005	0.090	230.000	0.100 <	
Brush Creek	12/08/88				0.005 <				
Brush Creek	11/11/88	190.000	0.010 <	0.200 <	0.005 <	0.070	230.000	0.100	
Brush Creek	10/20/88				0.005 <				
Brush Creek	09/27/88	174	0.1 <	0.17	0.01 <	0.073	204	0.05	0.01 <
Brush Creek	09/08/88				0.01 <				
Brush Creek	07/26/88				0.042				
Brush Creek	06/28/88	183	0.1 <	0.23	0.01	0.01 <	208	0.1	0.01 <
Brush Creek	06/02/88				0.01 <				
Brush Creek	04/25/88	159	0.1 <	0.1	0.033	0.203	189	0.13	0.01 <
Brush Creek	01/07/88	174	0.1 <	0.16	0.023	0.01 <	212	0.081	0.01 <
Brush Creek	10/15/87	177	0.1 <	0.13	0.038	0.19	216	0.08	0.01 <
RC-1 (=RC-B)	08/20/89				0.01 <				
RC-1 (=RC-B)	10/20/88				0.041				
RC-1 (=RC-B)	09/27/88		0.1 <		0.227	0.118	212	0.16	0.01 <
RC-1 (=RC-B)	09/08/88				0.117				
RC-1 (=RC-B)	07/26/88				0.18				
RC-1 (=RC-B)	06/28/88	240	0.92	0.1 <	0.068	0.01 <	274	0.49	0.01 <
RC-1 (=RC-B)	06/02/88				0.044				
RC-1 (=RC-B)	04/25/88	191	0.1 <	0.28	0.049	0.08	201	0.2	0.01 <
RC-1 (=RC-B)	03/23/88				0.022				
RC-1 (=RC-B)	03/16/88				0.021				
RC-1 (=RC-B)	03/09/88				0.019				
RC-1 (=RC-B)	03/02/88				0.029				
RC-1 (=RC-B)	02/25/88				0.072				
RC-1 (=RC-B)	02/18/88				0.028				
RC-1 (=RC-B)	02/11/88				0.072				
RC-1 (=RC-B)	02/04/88				0.021				
RC-1 (=RC-B)	01/28/88				0.028				
RC-1 (=RC-B)	01/21/88				0.02				
RC-1 (=RC-B)	01/14/88				0.033				
RC-1 (=RC-B)	01/07/88				0.019				
RC-1 (=RC-B)	12/17/87				0.032				

BARRICK GOLDSTRIKE - SURFACE WATER DATABASE
ENSR PROJECT NUMBER: 0739-001-202
FILE NAME: SW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
RC-1 (=RC-B)	12/10/87				0.019				
RC-1 (=RC-B)	12/03/87				0.011				
RC-1 (=RC-B)	11/24/87				0.012				
RC-1 (=RC-B)	11/19/87				0.044				
RC-1 (=RC-B)	11/06/87				0.033				
RC-1 (=RC-B)	10/29/87				0.015				
RC-1 (=RC-B)	10/21/87				0.023				
RC-1 (=RC-B)	10/15/87				0.01 <				
RC-1 (=RC-B)	10/08/87				0.01 <				
RC-1 (=RC-B)	10/01/87				0.01 <				
RC-1 (=RC-B)	09/25/87				0.01 <				
RC-1 (=RC-B)	09/17/87				0.01 <				
RC-1 (=RC-B)	08/27/87				0.01 <				
RC-1 (=RC-B)	08/27/87				0.01 <				
RC-1 (=RC-B)	08/13/87				0.01 <				
RC-1 (=RC-B)	08/06/87				0.01 <				
RC-1 (=RC-B)	07/27/87				0.01 <				
RC-1 (=RC-B)	07/20/87				0.01 <				
RC-1 (=RC-B)	07/09/87								
RC-1 (=RC-B)	06/30/87	200	0.1 <	0.33	0.01 <	0.018	230	0.19	0.01 <
RC-1 (=RC-B)	06/25/87								
RC-1 (=RC-B)	06/18/87								
RC-1 (=RC-B)	06/11/87								
RC-1 (=RC-B)	04/16/87	217	0.62	0.51	0.01 <	0.075	255	0.28	0.01 <
RC-B	08/17/89				0.097				
RC-B	07/17/89	160.000	0.600	0.200 <	0.041	0.080	150.000	0.100	
RC-B	06/27/89				0.084				
RC-B	05/17/89				0.045				
RC-B	04/11/89	140.000	1.300	0.200 <	0.140	0.070	170.000	0.140	
RC-B	03/21/89				0.041				
RC-B	02/17/89				0.038				
RC-B	01/04/89	240.000	0.200	0.200 <	0.036	0.080	290.000	0.100	
RC-B	12/08/88			0.600	0.520				
RC-B	11/11/88	200.000	0.100	0.200 <	0.039	0.060	220.000	0.100	
RC-2 (=RC-C)	10/20/88			0.200 <	0.045				
RC-2 (=RC-C)	09/27/88	168	0.1 <	0.18	0.075	0.213	200	0.41	0.01 <
RC-2 (=RC-C)	07/26/88				0.144				
RC-2 (=RC-C)	06/02/88				0.068				
RC-2 (=RC-C)	04/25/88	209	0.1 <	0.1	0.062	0.193	223	0.42	0.01 <
RC-2 (=RC-C)	03/23/88				0.032				
RC-2 (=RC-C)	03/16/88				0.018				
RC-2 (=RC-C)	03/09/88				0.052				
RC-2 (=RC-C)	03/02/88				0.068				
RC-2 (=RC-C)	01/28/88				0.022				
RC-2 (=RC-C)	01/21/88				0.018				
RC-2 (=RC-C)	01/14/88				0.024				
RC-2 (=RC-C)	01/07/88				0.028				

BARRICK GOLDSTRIKE - SURFACE WATER DATABASE
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FILE NAME: SW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
RC-2 (=RC-C)	12/30/87				0.037				
RC-2 (=RC-C)	12/17/87				0.087				
RC-2 (=RC-C)	12/10/87				0.067				
RC-2 (=RC-C)	12/03/87				0.048				
RC-2 (=RC-C)	11/24/87				0.142				
RC-2 (=RC-C)	11/19/87				0.107				
RC-2 (=RC-C)	11/06/87				0.062				
RC-2 (=RC-C)	10/29/87				0.013				
RC-2 (=RC-C)	10/21/87				0.012				
RC-2 (=RC-C)	10/15/87				0.01 <				
RC-2 (=RC-C)	10/08/87				0.01 <				
RC-2 (=RC-C)	10/01/87				0.01 <				
RC-2 (=RC-C)	09/25/87				0.012				
RC-2 (=RC-C)	09/17/87				0.01 <				
RC-2 (=RC-C)	09/03/87				0.01 <				
RC-2 (=RC-C)	08/27/87				0.01 <				
RC-2 (=RC-C)	08/20/87				0.01 <				
RC-2 (=RC-C)	08/13/87				0.01 <				
RC-2 (=RC-C)	08/06/87				0.01 <				
RC-2 (=RC-C)	07/30/87				0.01 <				
RC-2 (=RC-C)	07/27/87				0.01 <				
RC-2 (=RC-C)	07/16/87								
RC-2 (=RC-C)	07/09/87								
RC-2 (=RC-C)	06/30/87	351	0.1 <	0.86	0.01 <	0.025	400	0.78	0.01 <
RC-2 (=RC-C)	06/25/87								
RC-2 (=RC-C)	06/18/87								
RC-2 (=RC-C)	06/11/87								
RC-2 (=RC-C)	04/16/87	348	0.36	0.92	0.011	0.107	396	0.72	0.01 <
RC-C	07/17/89	110.000	0.400	0.200 <	0.210	0.130	90.000	0.400	
RC-C	06/27/89				0.110				
RC-C	05/17/89				0.078				
RC-C	04/11/89	98.000	1.100	0.200	0.035	0.100	110.000	0.100 <	
RC-C	03/21/89				0.055				
RC-C	01/04/89	140.000	0.400	7.500	0.076	0.100	170.000	0.400	
RC-C	12/08/88			0.500	1.400				
RC-C	11/11/88	310.000	0.100	0.200 <	0.053	0.080	320.000	0.300	
RC-3	10/20/88				0.100				
RC-3	09/27/88	197	0.1 <	0.14	0.092	0.17	235	0.14	0.01 <
RC-3	09/08/88				0.12				
RC-3	07/26/88				0.122				
RC-3	06/28/88	175	0.1 <	0.1 <	0.059	0.01 <	208	0.21	0.01 <
RC-3	06/02/88				0.108				
RC-3	04/25/88	158	0.1 <	0.1 <	0.059	0.14	184	0.17	0.01 <
RC-3	03/23/88				0.024				
RC-3	03/02/88				0.028				
RC-3	02/18/88				0.059				
RC-3	02/11/88	132	0.1 <	0.24	0.056	0.205	161	0.098	0.01 <

BARRICK GOLDSTRIKE - SURFACE WATER DATABASE
ENSR PROJECT NUMBER: 0739-001-202
FILE NAME: SW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
RC-3	01/07/88	152	0.1 <	1.44	0.029	0.04	185	0.091	0.01 <
RC-3 1/2	03/02/88				0.042				
RC-4	12/21/88				0.160				
RC-4	06/02/88				0.044				
RC-4	04/25/88	127	0.1 <	0.1 <	0.066	0.073	128	0.21	0.01 <
RC-4	03/23/88				0.03				
RC-4	02/18/88				0.062				
RC-4	02/11/88	96.7	0.1 <	0.18	0.062	0.148	118	0.072	0.01 <
RC-4	01/07/88	180	0.1 <	0.16	0.042	0.07	189	0.131	0.01 <
RC-5 (=RC-A)	10/20/88			0.200 <	0.110				
RC-5 (=RC-A)	09/27/88	183	0.100 <	0.200	0.840	0.193	217.000	0.200	
RC-5 (=RC-A)	09/08/88				0.175				
RC-5 (=RC-A)	07/26/88				0.230				
RC-A	09/13/89			0.200 <	0.160				
RC-A	08/17/89			0.200 <	0.210				
RC-A	07/17/89	210.000	0.010 <	0.200 <	0.180	0.170	250.000	0.200	
RC-A	06/27/89			0.300	0.160				
RC-A	05/17/89			0.200 <	0.160				
RC-A	04/11/89	150.000	0.100	0.200 <	0.097	0.180	180.000	0.200	
RC-A	03/21/89			0.200 <	0.110				
RC-A	12/08/88			0.200 <	0.091				
RC-A	11/11/88	210.000	0.100 <	0.200 <	0.063	0.200	250.000	0.100	
SFD-1	09/25/87				0.01 <				

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
BC-A	05/19/89						240		0.005 <
BC-A	04/11/89	12.000	5.000 <	3.200		0.005 <	140	0.005 <	0.005 <
BC-A	03/21/89						210		0.005 <
BC-B	05/19/89						240		0.005 <
BC-B	04/11/89	13.000	5.000 <	3.600		0.005 <	150	0.005 <	0.005 <
Bell Creek	03/10/88	39.2	0	9.21	0.01 <	0.02	380	0.01 <	0.002 <
Brush Creek	09/13/89						360		0.005 <
Brush Creek	08/17/89						530		0.005 <
Brush Creek	07/17/89	48.000	5.000 <	17.000		0.005 <	490	0.005 <	0.005 <
Brush Creek	06/27/89						500		0.005 <
Brush Creek	05/17/89						510		0.005 <
Brush Creek	04/12/89	29.000	5.000 <	7.000		0.005 <	320	0.005 <	0.005 <
Brush Creek	03/21/89						350		0.005 <
Brush Creek	02/17/89						360		0.005 <
Brush Creek	01/04/89	52.000	5.000 <	27.000		0.005 <	650	0.005 <	0.005 <
Brush Creek	12/08/88						600		0.005 <
Brush Creek	11/11/88	48.000	5.000 <	16.000		0.005 <	550	0.005 <	0.005 <
Brush Creek	10/20/88						510		0.005 <
Brush Creek	09/27/88	14.2	0	19.2	0.01 <	0.01 <	491	0.01 <	0.002 <
Brush Creek	09/08/88						485		0.04
Brush Creek	07/26/88						518		0.002
Brush Creek	06/28/88	26.8	0	12.7	0.01 <	0.01 <	483	0.01 <	0.002 <
Brush Creek	06/02/88						484		0.002 <
Brush Creek	04/25/88	25.2	2.7	14.8	0.01 <	0.01 <	471	0.01 <	0.002 <
Brush Creek	01/07/88	48.8	0	18.9	0.01 <	0.01 <	469	0.01 <	0.002 <
Brush Creek	10/15/87	52.4	0	19.7	0.01 <	0.01 <	488	0.01 <	0.002 <
RC-1 (=RC-B)	08/20/89	25.3					581		
RC-1 (=RC-B)	10/20/88						920		0.006
RC-1 (=RC-B)	09/27/88	77.1	0	49		0.015	1032	0.01	0.0095
RC-1 (=RC-B)	09/08/88						660		0.002 <
RC-1 (=RC-B)	07/26/88						744		0.002 <
RC-1 (=RC-B)	06/28/88	28.4	9.6	19.1	0.01 <	0.01 <	733	0.01	0.002 <
RC-1 (=RC-B)	06/02/88						613		0.002 <
RC-1 (=RC-B)	04/25/88	30.5	16.1	23.6	0.01 <	0.01 <	618	0.01	0.005
RC-1 (=RC-B)	03/23/88	66.2					704		
RC-1 (=RC-B)	03/16/88	32.9					617		
RC-1 (=RC-B)	03/09/88	42.8					637		
RC-1 (=RC-B)	03/02/88	34.3					660		
RC-1 (=RC-B)	02/25/88	43.7					590		
RC-1 (=RC-B)	02/18/88	41.4					585		
RC-1 (=RC-B)	02/11/88	13.4					648		
RC-1 (=RC-B)	02/04/88	24.8					626		
RC-1 (=RC-B)	01/28/88	21.8					613		
RC-1 (=RC-B)	01/21/88	21.9					602		
RC-1 (=RC-B)	01/14/88	19.2					626		
RC-1 (=RC-B)	01/07/88	19.5					605		
RC-1 (=RC-B)	12/17/87	42.4					606		

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
RC-1 (=RC-B)	12/10/87	36.8					607		
RC-1 (=RC-B)	12/03/87	49.2					555		
RC-1 (=RC-B)	11/24/87	45.2					572		
RC-1 (=RC-B)	11/19/87	47.8					585		
RC-1 (=RC-B)	11/06/87	35.5					531		
RC-1 (=RC-B)	10/29/87	25.6					558		
RC-1 (=RC-B)	10/21/87	27.9					773		
RC-1 (=RC-B)	10/15/87	20.8					534		
RC-1 (=RC-B)	10/08/87	18.7					614		
RC-1 (=RC-B)	10/01/87	11.8					510		
RC-1 (=RC-B)	09/25/87	49.4					770		
RC-1 (=RC-B)	09/17/87	52.5					526		
RC-1 (=RC-B)	08/27/87	13.9					532		
RC-1 (=RC-B)	08/27/87	14.9					574		
RC-1 (=RC-B)	08/13/87	26.2					587		
RC-1 (=RC-B)	08/06/87	26.9					568		
RC-1 (=RC-B)	07/27/87						562		
RC-1 (=RC-B)	07/20/87						530		
RC-1 (=RC-B)	07/09/87						550		
RC-1 (=RC-B)	06/30/87	36.2	7.1	26.3	0.01 <	0.01 <	578	0.01 <	0.002 <
RC-1 (=RC-B)	06/25/87						552		
RC-1 (=RC-B)	06/18/87						547		
RC-1 (=RC-B)	06/11/87						542		
RC-1 (=RC-B)	04/16/87	42	4.8	28	0.01 <	0.01 <	622	0.01 <	0.002 <
RC-B	08/17/89						590		0.005 <
RC-B	07/17/89	48.000	24.000	21.000		0.005 <	540	0.005 <	0.005 <
RC-B	06/27/89						520		0.005 <
RC-B	05/17/89						560		0.005 <
RC-B	04/11/89	36.000	5.000 <	13.000		0.005 <	430	0.005 <	0.005 <
RC-B	03/21/89						470		0.005 <
RC-B	02/17/89						470		0.005 <
RC-B	01/04/89	70.000	5.000 <	29.000		0.005 <	780	0.005 <	0.005 <
RC-B	12/08/88						950		0.005 <
RC-B	11/11/88	68.000	6.000	28.000		0.005 <	800	0.005 <	0.005 <
RC-2 (=RC-C)	10/20/88						700		0.028
RC-2 (=RC-C)	09/27/88	62.7	0	51.8	0.01 <	0.01 <	1030	0.01 <	0.015
RC-2 (=RC-C)	07/26/88						754		0.005
RC-2 (=RC-C)	06/02/88						670		0.002 <
RC-2 (=RC-C)	04/25/88	33.8	15.7	25.1	0.01 <	0.01 <	669	0.01 <	0.004
RC-2 (=RC-C)	03/23/88	38.9					684		
RC-2 (=RC-C)	03/16/88	35.5					672		
RC-2 (=RC-C)	03/09/88	36.1					734		
RC-2 (=RC-C)	03/02/88	34.1					748		
RC-2 (=RC-C)	01/28/88	46.2					832		
RC-2 (=RC-C)	01/21/88	45.7					832		
RC-2 (=RC-C)	01/14/88	42.8					851		
RC-2 (=RC-C)	01/07/88	37.1					886		

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
RC-2 (=RC-C)	12/30/87	6.2					853		
RC-2 (=RC-C)	12/17/87	88.9					865		
RC-2 (=RC-C)	12/10/87	56.8					922		
RC-2 (=RC-C)	12/03/87	85.8					940		
RC-2 (=RC-C)	11/24/87	78.9					891		
RC-2 (=RC-C)	11/19/87	79.7					791		
RC-2 (=RC-C)	11/06/87	38.9					790		
RC-2 (=RC-C)	10/29/87	73.4					883		
RC-2 (=RC-C)	10/21/87	37.2					578		
RC-2 (=RC-C)	10/15/87	48.9					793		
RC-2 (=RC-C)	10/08/87	38.7					778		
RC-2 (=RC-C)	10/01/87	28.5					846		
RC-2 (=RC-C)	09/25/87	69.1					998		
RC-2 (=RC-C)	09/17/87	74.8					805		
RC-2 (=RC-C)	09/03/87	18.3					756		
RC-2 (=RC-C)	08/27/87	18.8					770		
RC-2 (=RC-C)	08/20/87	30.6					762		
RC-2 (=RC-C)	08/13/87	7.4					808		
RC-2 (=RC-C)	08/06/87	23.2					717		
RC-2 (=RC-C)	07/30/87						684		
RC-2 (=RC-C)	07/27/87						687		
RC-2 (=RC-C)	07/16/87						800		
RC-2 (=RC-C)	07/09/87						783		
RC-2 (=RC-C)	06/30/87	142	13.6	36.7	0.01 <	0.01 <	878	0.01 <	0.005
RC-2 (=RC-C)	06/25/87						1160		
RC-2 (=RC-C)	06/18/87						686		
RC-2 (=RC-C)	06/11/87						686		
RC-2 (=RC-C)	04/16/87	80	14.2	102	0.01 <	0.01 <	1210	0.01 <	0.002 <
RC-C	07/17/89	32.000	24.000	43.000		0.005 <	620	0.005 <	0.005 <
RC-C	06/27/89						610		0.005 <
RC-C	05/17/89						470		0.005
RC-C	04/11/89	26.000	5.000 <	7.300		0.005 <	290	0.005 <	0.005 <
RC-C	03/21/89						330		0.005 <
RC-C	01/04/89	270.000	5.000 <	74.000		0.005 <	2700	0.005 <	0.005 <
RC-C	12/08/88						860		0.005 <
RC-C	11/11/88	71.000	26.000	29.000		0.005 <	760	0.005 <	0.005 <
RC-3	10/20/88						450		0.007
RC-3	09/27/88	33.1	0	62	0.01 <	0.01 <	692	0.015	0.011
RC-3	09/08/88						598		0.011
RC-3	07/26/88						442		0.006
RC-3	06/28/88	28	0	26	0.01 <	0.01 <	498	0.01 <	0.008
RC-3	06/02/88						602		0.004
RC-3	04/25/88	17.2	4.2	25.2	0.01 <	0.01 <	457	0.015	0.004
RC-3	03/23/88	19.6					457		
RC-3	03/02/88	18.3					425		
RC-3	02/18/88	30.8					444		
RC-3	02/11/88	28.9	0	14.8	0.01 <	0.01 <	376	0.02	0.0033

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
RC-3	01/07/88	34.2	0	25.6	0.01 <	0.01 <	433	0.015	0.006
RC-3 1/2	03/02/88	18.1					443		
RC-4	12/21/88						590		0.005 <
RC-4	06/02/88						563		0.002 <
RC-4	04/25/88	25.2	12.7	33.6	0.01 <	0.01 <	511	0.01 <	0.004
RC-4	03/23/88	37.2					648		
RC-4	02/18/88	45.2					529		0.0028
RC-4	02/11/88	54.6	0	75.7	0.015	0.01 <	327	0.033	0.017
RC-4	01/07/88	53	15.2	31	0.01 <	0.01 <	560 <	0.01 <	0.002 <
RC-5 (=RC-A)	10/20/88						460		0.005 <
RC-5 (=RC-A)	09/27/88	30.200	0	63.900	0.01 <	0.010 <	713	0.010 <	0.012
RC-5 (=RC-A)	09/08/88								0.021
RC-5 (=RC-A)	07/26/88						445		0.002 <
RC-A	09/13/89						520		0.005 <
RC-A	08/17/89						710		0.005 <
RC-A	07/17/89	55.000	5.000 <	53.000		0.005 <	650	0.005 <	
RC-A	06/27/89						720		0.005 <
RC-A	05/17/89						690		0.010 <
RC-A	04/11/89	62.000	5.000 <	98.000		0.005 <	780	0.005 <	0.005 <
RC-A	03/21/89						830		0.005 <
RC-A	12/08/88						930		0.005 <
RC-A	11/11/88	64.000	5.000 <	64.000		0.005 <	750	0.005 <	0.005 <
SPD-1	09/25/87	82.2					1080		

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)
BC-A	05/19/89	0.100 <	0.005 <		0.005 <			
BC-A	04/11/89	0.100 <	0.005 <	0.500 <	0.005 <	51.000		
BC-A	03/21/89	0.100 <	0.005 <		0.005 <			
BC-B	05/19/89	0.100 <	0.005 <		0.005 <			
BC-B	04/11/89	0.100 <	0.005 <	0.500 <	0.005 <	51.000		
Bell Creek	03/10/88	0.002 <		0.43 <	0.01	178	9	188
Brush Creek	09/13/89	0.100 <	0.005 <		0.005 <			
Brush Creek	08/17/89	0.100 <	0.005 <		0.005 <			
Brush Creek	07/17/89	0.100 <	0.005 <	0.600	0.005 <	230.000		
Brush Creek	06/27/89	0.100 <	0.005 <		0.005 <			
Brush Creek	05/17/89	0.100 <	0.005 <		0.005 <			
Brush Creek	04/12/89	0.100 <	0.005 <	0.600	0.005 <	150.000		
Brush Creek	03/21/89	0.100 <	0.005 <		0.005 <			
Brush Creek	02/17/89	0.100 <	0.005 <		0.005 <			
Brush Creek	01/04/89	0.100 <	0.005 <	0.600	0.005 <	230.000		
Brush Creek	12/08/88	0.010 <	0.005 <		0.005 <			
Brush Creek	11/11/88	0.100 <	0.005	0.800	0.050 <	200.000		
Brush Creek	10/20/88	0.100 <	0.005 <		0.005 <			
Brush Creek	09/27/88	0.002 <		0.66 <	0.01	114	0	129
Brush Creek	09/08/88	0.002 <			0.03			
Brush Creek	07/26/88	0.002 <			0.01 <			
Brush Creek	06/28/88	0.002 <		0.62	0.01 <	217	9	239
Brush Creek	06/02/88	0.002 <			0.01 <			
Brush Creek	04/25/88	0.002 <		0.12	0.01 <	180	0	175
Brush Creek	01/07/88	0.002 <		0.2	0.01 <	218	6	213
Brush Creek	10/15/87	0.002 <		0.55	0.01 <	202	0	182
RC-1 (=RC-B)	08/20/89							
RC-1 (=RC-B)	10/20/88	0.010 <	0.005		0.005			
RC-1 (=RC-B)	09/27/88	0.002 <		0.96	0.01 <	560	348	473
RC-1 (=RC-B)	09/08/88	0.002 <			0.038			
RC-1 (=RC-B)	07/26/88	0.002 <			0.01 <			
RC-1 (=RC-B)	06/28/88	0.002 <		0.98	0.01 <	241	0	255
RC-1 (=RC-B)	06/02/88	0.002 <			0.01 <			
RC-1 (=RC-B)	04/25/88	0.002 <		0.12	0.01 <	196	0	205
RC-1 (=RC-B)	03/23/88							
RC-1 (=RC-B)	03/16/88							
RC-1 (=RC-B)	03/09/88							
RC-1 (=RC-B)	03/02/88							
RC-1 (=RC-B)	02/25/88							
RC-1 (=RC-B)	02/18/88							
RC-1 (=RC-B)	02/11/88							
RC-1 (=RC-B)	02/04/88							
RC-1 (=RC-B)	01/28/88							
RC-1 (=RC-B)	01/21/88							
RC-1 (=RC-B)	01/14/88							
RC-1 (=RC-B)	01/07/88							
RC-1 (=RC-B)	12/17/87							

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)
RC-1 (=RC-B)	12/10/87							
RC-1 (=RC-B)	12/03/87							
RC-1 (=RC-B)	11/24/87							
RC-1 (=RC-B)	11/19/87							
RC-1 (=RC-B)	11/06/87							
RC-1 (=RC-B)	10/29/87							
RC-1 (=RC-B)	10/21/87							
RC-1 (=RC-B)	10/15/87							
RC-1 (=RC-B)	10/08/87							
RC-1 (=RC-B)	10/01/87							
RC-1 (=RC-B)	09/25/87							
RC-1 (=RC-B)	09/17/87							
RC-1 (=RC-B)	08/27/87							
RC-1 (=RC-B)	08/27/87							
RC-1 (=RC-B)	08/13/87							
RC-1 (=RC-B)	08/06/87							
RC-1 (=RC-B)	07/27/87							
RC-1 (=RC-B)	07/20/87							
RC-1 (=RC-B)	07/09/87							
RC-1 (=RC-B)	06/30/87	0.002 <		0.5	0.01 <	204	0	167
RC-1 (=RC-B)	06/25/87							
RC-1 (=RC-B)	06/18/87							
RC-1 (=RC-B)	06/11/87							
RC-1 (=RC-B)	04/16/87	0.002 <		0.71	0.01 <	236	0	247
RC-B	08/17/89	0.100 <	0.005 <		0.005 <			
RC-B	07/17/89	0.100 <	0.005 <	0.600	0.005 <	230.000		
RC-B	06/27/89	0.100 <	0.005 <		0.005 <			
RC-B	05/17/89	0.100 <	0.005 <		0.005 <			
RC-B	04/11/89	0.100 <	0.005 <	0.700	0.005 <	160.000		
RC-B	03/21/89	0.100 <	0.005 <		0.005 <			
RC-B	02/17/89	0.100 <	0.005 <		0.005 <			
RC-B	01/04/89	0.100 <	0.005 <	0.700	0.005 <	290.000		
RC-B	12/08/88	0.100 <	0.005 <		0.005 <			
RC-B	11/11/88	0.100 <	0.005 <	0.700	0.050 <	290.000		
RC-2 (=RC-C)	10/20/88	0.100 <	0.015		0.005 <			
RC-2 (=RC-C)	09/27/88	0.002 <		0.98	0.01 <	453	253	436
RC-2 (=RC-C)	07/26/88	0.002 <			0.01 <			
RC-2 (=RC-C)	06/02/88	0.002			0.01 <			
RC-2 (=RC-C)	04/25/88	0.002 <		0.25	0.023	222	0	212
RC-2 (=RC-C)	03/23/88							
RC-2 (=RC-C)	03/16/88							
RC-2 (=RC-C)	03/09/88							
RC-2 (=RC-C)	03/02/88							
RC-2 (=RC-C)	01/28/88							
RC-2 (=RC-C)	01/21/88							
RC-2 (=RC-C)	01/14/88							
RC-2 (=RC-C)	01/07/88							

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)
RC-2 (=RC-C)	12/30/87							
RC-2 (=RC-C)	12/17/87							
RC-2 (=RC-C)	12/10/87							
RC-2 (=RC-C)	12/03/87							
RC-2 (=RC-C)	11/24/87							
RC-2 (=RC-C)	11/19/87							
RC-2 (=RC-C)	11/06/87							
RC-2 (=RC-C)	10/29/87							
RC-2 (=RC-C)	10/21/87							
RC-2 (=RC-C)	10/15/87							
RC-2 (=RC-C)	10/08/87							
RC-2 (=RC-C)	10/01/87							
RC-2 (=RC-C)	09/25/87							
RC-2 (=RC-C)	09/17/87							
RC-2 (=RC-C)	09/03/87							
RC-2 (=RC-C)	08/27/87							
RC-2 (=RC-C)	08/20/87							
RC-2 (=RC-C)	08/13/87							
RC-2 (=RC-C)	08/06/87							
RC-2 (=RC-C)	07/30/87							
RC-2 (=RC-C)	07/27/87							
RC-2 (=RC-C)	07/16/87							
RC-2 (=RC-C)	07/09/87							
RC-2 (=RC-C)	06/30/87	0.002 <		1.27	0.01 <	397	0	440
RC-2 (=RC-C)	06/25/87							
RC-2 (=RC-C)	06/18/87							
RC-2 (=RC-C)	06/11/87							
RC-2 (=RC-C)	04/16/87	0.002 <		1.54	0.01 <	329	0	373
RC-C	07/17/89	0.100 <	0.005 <	1.000	0.005 <	200.000		
RC-C	06/27/89	0.100 <	0.005 <		0.005 <			
RC-C	05/17/89	0.100 <	0.005 <		0.005 <			
RC-C	04/11/89	0.100 <	0.005 <	0.500	0.005 <	110.000		
RC-C	03/21/89	0.100 <	0.005 <		0.005 <			
RC-C	01/04/89	0.100 <	0.005 <	0.700	0.005 <	1000.000		
RC-C	12/08/88	0.100 <	0.005 <		0.005 <			
RC-C	11/11/88	0.100 <	0.005 <	1.000	0.050 <	270.000		
RC-3	10/20/88	0.100 <	0.005 <		0.005 <			
RC-3	09/27/88	0.002 <		0.78	0.01 <	200	0	165
RC-3	09/08/88	0.002 <			0.02			
RC-3	07/26/88	0.002 <			0.01 <			
RC-3	06/28/88	0.002 <		0.64	0.01 <	160	0	143
RC-3	06/02/88	0.002 <			0.01 <			
RC-3	04/25/88	0.002 <		0.1 <	0.01 <	108	0	110
RC-3	03/23/88							
RC-3	03/02/88							
RC-3	02/18/88	0.002 <			0.01 <			
RC-3	02/11/88	0.002 <		0.44	0.01 <	125	0	115

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)
RC-3	01/07/88	0.002 <		0.3	0.01 <	173	0	138
RC-3 1/2	03/02/88							
RC-4	12/21/88	0.100 <	0.005 <		0.005 <			
RC-4	06/02/88	0.002 <			0.01 <			
RC-4	04/25/88	0.002 <		0.1 <	0.01 <	170	0	174
RC-4	03/23/88							
RC-4	02/18/88				0.01 <			
RC-4	02/11/88	0.01		0.35	0.01 <	146	0	166
RC-4	01/07/88	0.002		0.29	0.01 <	231	27	226
RC-5 (=RC-A)	10/20/88	0.100 <	0.005 <		0.005 <			
RC-5 (=RC-A)	09/27/88	0.002 <		0.510	0.01 <	145.000	0	158
RC-5 (=RC-A)	09/08/88	0.002 <			0.025			
RC-5 (=RC-A)	07/26/88	0.002 <			0.010 <			
RC-A	09/13/89	0.100 <	0.005 <		0.005 <			
RC-A	08/17/89	0.100 <	0.005 <		0.005 <			
RC-A	07/17/89	0.100 <		0.600	0.005 <	220.000		
RC-A	06/27/89	0.100 <	0.005 <		0.005 <			
RC-A	05/17/89	0.100 <	0.010 <		0.005 <			
RC-A	04/11/89	0.100 <	0.005 <	0.500 <	0.005 <	220.000		
RC-A	03/21/89	0.100 <	0.005 <		0.005 <			
RC-A	12/08/88	0.100 <	0.005 <		0.005 <			
RC-A	11/11/88	0.100 <	0.005 <	0.500 <	0.050 <	220.000		
SPD-1	09/25/87							

Well ID	Sampling Date	Hydroxide	BODs	COD	TOC	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury
BC-A	05/19/89										
BC-A	04/11/89	5.000 <					1.600	0.005 <	4.500	0.045	0.0001 <
BC-A	03/21/89										
BC-B	05/19/89										
BC-B	04/11/89	5.000 <					1.800	0.005 <	5.000	0.043	0.0001 <
Bell Creek	03/10/88	0				0.22	5.34 <	0.01	21.7	0.138 <	0.0002
Brush Creek	09/13/89										
Brush Creek	08/17/89										
Brush Creek	07/17/89	5.000 <					0.080	0.005 <	22.000	0.012	0.0001 <
Brush Creek	06/27/89										
Brush Creek	05/17/89										
Brush Creek	04/12/89	5.000 <					0.670	0.005 <	14.000	0.032	0.0001 <
Brush Creek	03/21/89										
Brush Creek	02/17/89										
Brush Creek	01/04/89	5.000 <					0.010 <	0.005 <	24.000	0.005 <	0.0001 <
Brush Creek	12/08/88										
Brush Creek	11/11/88	5.000 <					0.010	0.005 <	24.000	0.005 <	0.0001 <
Brush Creek	10/20/88										
Brush Creek	09/27/88	0	1 <	3	231	0.01 <	0.135	0.01 <	22.8	0.01 <	0.0002 <
Brush Creek	09/08/88										
Brush Creek	07/26/88										
Brush Creek	06/28/88	0	1	5 <	12.9	0.045	0.058	0.01 <	41.9	0.01 <	0.0002 <
Brush Creek	06/02/88										
Brush Creek	04/25/88	0	1.8	5 <	42	0.01 <	0.098	0.01 <	27.2	0.2	0.0002 <
Brush Creek	01/07/88	0				0.01 <	0.13	0.01 <	22.1	0.01 <	0.0002 <
Brush Creek	10/15/87	0				0.01 <	0.14	0.01 <	23.2 <	0.01 <	0.0002 <
RC-1 (=RC-B)	08/20/89					0.01 <	0.21		23.4		0.0002 <
RC-1 (=RC-B)	10/20/88										
RC-1 (=RC-B)	09/27/88	0	1 <	11 <	31.2	0.01 <	0.118	0.01 <	68.1	0.01 <	0.0002 <
RC-1 (=RC-B)	09/08/88										
RC-1 (=RC-B)	07/26/88										
RC-1 (=RC-B)	06/28/88	0	1 <	5 <	8.4	0.073	1.02	0.01 <	44.8	0.065	0.0002 <
RC-1 (=RC-B)	06/02/88										
RC-1 (=RC-B)	04/25/88	0	1 <	5 <	28	0.01 <	0.1	0.01 <	31.2	0.023	0.0002 <
RC-1 (=RC-B)	03/23/88					0.029	32.8		35.7		0.0002 <
RC-1 (=RC-B)	03/16/88					0.01 <	4.36		34.7		0.0002 <
RC-1 (=RC-B)	03/09/88					0.01 <	0.46		34.9		0.0002 <
RC-1 (=RC-B)	03/02/88					0.01 <	2.56		35.2		0.0002 <
RC-1 (=RC-B)	02/25/88					0.018	3.07		18.4		0.0002 <
RC-1 (=RC-B)	02/18/88					0.01 <	0.37		20.3		0.0002 <
RC-1 (=RC-B)	02/11/88					0.084	6.1		15.4		0.00028
RC-1 (=RC-B)	02/04/88					0.01 <	0.505		27.1		0.0002 <
RC-1 (=RC-B)	01/28/88					0.01 <	0.328		25.3		0.0002 <
RC-1 (=RC-B)	01/21/88					0.01 <	0.355		24.9		0.0002 <
RC-1 (=RC-B)	01/14/88					0.01 <	0.385		23.3		0.0002 <
RC-1 (=RC-B)	01/07/88					0.01 <	0.38		23.2		0.0002 <
RC-1 (=RC-B)	12/17/87					0.01 <	0.215		24.1		0.0002 <

Well ID	Sampling Date	Hydroxide	BODs	COD	TOC	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury
RC-1 (=RC-B)	12/10/87					0.01 <	0.13		26.5		0.0002 <
RC-1 (=RC-B)	12/03/87					0.01 <	0.1		24.7		0.0002 <
RC-1 (=RC-B)	11/24/87					0.01 <	0.14		24.2		0.0002 <
RC-1 (=RC-B)	11/19/87					0.01 <	0.17		24.3		0.0002 <
RC-1 (=RC-B)	11/06/87					0.011	0.352		32.9		0.0002 <
RC-1 (=RC-B)	10/29/87					0.01 <	0.103		26.7		0.0002 <
RC-1 (=RC-B)	10/21/87					0.01 <	0.01 <		27.8		0.0002 <
RC-1 (=RC-B)	10/15/87					0.01 <	0.26		22.9		0.0002 <
RC-1 (=RC-B)	10/08/87					0.082	0.64		22.1		0.0002 <
RC-1 (=RC-B)	10/01/87					0.01 <	0.18		25.4		0.0002 <
RC-1 (=RC-B)	09/25/87					0.011	0.22		20.8		0.0002 <
RC-1 (=RC-B)	09/17/87					0.015	0.175		21.8		0.002 <
RC-1 (=RC-B)	08/27/87					0.048	0.36		22.6		0.0002
RC-1 (=RC-B)	08/27/87					0.01 <	0.39		22.5		0.0002 <
RC-1 (=RC-B)	08/13/87					0.01 <	0.48		23.6		0.0002 <
RC-1 (=RC-B)	08/06/87					0.01 <	0.3		24.2		0.0002 <
RC-1 (=RC-B)	07/27/87					0.01 <	0.9				0.0002 <
RC-1 (=RC-B)	07/20/87					0.01 <	0.36				0.0002 <
RC-1 (=RC-B)	07/09/87										
RC-1 (=RC-B)	06/30/87	0				0.01 <	0.12	0.055	18.7	0.01 <	0.0002 <
RC-1 (=RC-B)	06/25/87										
RC-1 (=RC-B)	06/18/87										
RC-1 (=RC-B)	06/11/87										
RC-1 (=RC-B)	04/16/87	0				0.023	0.255	0.01 <	33.8	0.01 <	0.0002 <
RC-B	08/17/89										
RC-B	07/17/89	5.000 <					0.550	0.005 <	24.000	0.017	0.0001 <
RC-B	06/27/89										
RC-B	05/17/89										
RC-B	04/11/89	5.000 <					1.100	0.005 <	16.000	0.041	0.0002
RC-B	03/21/89										
RC-B	02/17/89										
RC-B	01/04/89	5.000 <					0.160	0.005 <	29.000	0.080	0.0001 <
RC-B	12/08/88										
RC-B	11/11/88	5.000 <					0.140	0.005 <	30.000	0.075	0.0001 <
RC-2 (=RC-C)	10/20/88										
RC-2 (=RC-C)	09/27/88	0	2.3	15	38	0.01 <	0.133	0.01 <	67.9	0.01 <	0.0002 <
RC-2 (=RC-C)	07/26/88										
RC-2 (=RC-C)	06/02/88										
RC-2 (=RC-C)	04/25/88	0	1 <	5 <	32	0.01 <	0.605	0.01 <	31.1	0.01 <	0.0002 <
RC-2 (=RC-C)	03/23/88					0.01 <	6.32		36.1		0.0002 <
RC-2 (=RC-C)	03/16/88					0.01 <	2.83		36.8		0.0002 <
RC-2 (=RC-C)	03/09/88					0.022	8.46		36.4		0.0002 <
RC-2 (=RC-C)	03/02/88					0.01 <	12.3		33.2		0.0002 <
RC-2 (=RC-C)	01/28/88					0.01 <	1.05		27.6		0.0002 <
RC-2 (=RC-C)	01/21/88					0.01 <	0.67		27.7		0.0002 <
RC-2 (=RC-C)	01/14/88					0.01 <	0.855		27.6		0.0002 <
RC-2 (=RC-C)	01/07/88					0.01 <	0.88		27.1		0.0002 <

Well ID	Sampling Date	Hydroxide	BOD5	COD	TOC	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury
RC-2 (=RC-C)	12/30/87					0.01 <	0.48		25.3		0.0002 <
RC-2 (=RC-C)	12/17/87					0.01 <	6.7		30.4		0.00024
RC-2 (=RC-C)	12/10/87					0.12	4.6		32.2		0.00032
RC-2 (=RC-C)	12/03/87					0.03	1.92		30.2		0.00056
RC-2 (=RC-C)	11/24/87					0.01 <	5.33		29.7		0.0002 <
RC-2 (=RC-C)	11/19/87					0.01 <	2.07		29.9		0.0002 <
RC-2 (=RC-C)	11/06/87					0.22	5.98		33.4		0.0002 <
RC-2 (=RC-C)	10/29/87					0.12	0.62		35.1		0.0002 <
RC-2 (=RC-C)	10/21/87					0.01 <	0.34		31.1		0.0002 <
RC-2 (=RC-C)	10/15/87					0.092	0.84		26.2		0.0002 <
RC-2 (=RC-C)	10/08/87					0.1	0.44		25.8		0.0002 <
RC-2 (=RC-C)	10/01/87					0.35	6.7		30.3		0.0002 <
RC-2 (=RC-C)	09/25/87					0.018	0.708		28.7		0.0002 <
RC-2 (=RC-C)	09/17/87					0.028	0.512		26.3		0.0002 <
RC-2 (=RC-C)	09/03/87					0.1	1.56		24.4		0.0002 <
RC-2 (=RC-C)	08/27/87					0.082	1.24		23.2		0.0002 <
RC-2 (=RC-C)	08/20/87					0.01 <	0.45		26		0.0002 <
RC-2 (=RC-C)	08/13/87					0.01 <	0.35		24.2		0.0002 <
RC-2 (=RC-C)	08/06/87					0.01 <	0.56		24.2		0.0002 <
RC-2 (=RC-C)	07/30/87					0.01 <	0.67				0.0002 <
RC-2 (=RC-C)	07/27/87					0.01 <	0.57				0.0002 <
RC-2 (=RC-C)	07/16/87										
RC-2 (=RC-C)	07/09/87										
RC-2 (=RC-C)	06/30/87	0				0.29	1.51	0.073	20.7	0.043	0.0002 <
RC-2 (=RC-C)	06/25/87										
RC-2 (=RC-C)	06/18/87										
RC-2 (=RC-C)	06/11/87										
RC-2 (=RC-C)	04/16/87	0				0.01 <	0.283	0.01 <	41.5	0.018	0.0002 <
RC-C	07/17/89	5.000 <					0.410	0.005 <	27.000	0.030	0.0001 <
RC-C	06/27/89										
RC-C	05/17/89										
RC-C	04/11/89	5.000 <					1.000	0.005 <	10.000	0.036	0.0001 <
RC-C	03/21/89										
RC-C	01/04/89	5.000 <					0.280	0.005 <	87.000	0.200	0.0000
RC-C	12/08/88										
RC-C	11/11/88	5.000 <					0.100	0.005 <	29.000	0.006	0.0001 <
RC-3	10/20/88										
RC-3	09/27/88	0	2.4	19	17.8	0.01 <	0.435	0.01 <	19.9	0.048	0.0002 <
RC-3	09/08/88										
RC-3	07/26/88										
RC-3	06/28/88	0	1 <	5	<14.7	0.05	0.158	0.01 <	17.8	0.01	0.0002 <
RC-3	06/02/88										
RC-3	04/25/88	0	1 <	5 <	23	0.01 <	2.76	0.01 <	16.2	0.2	0.0002 <
RC-3	03/23/88					0.01 <	0.67		19.8		0.0002 <
RC-3	03/02/88					0.01 <	2.68		17.2		0.0002 <
RC-3	02/18/88					0.01 <	1.07		11.2		0.00022
RC-3	02/11/88	0				0.11	5.6	0.03	8.2	0.125	0.0002 <

Well ID	Sampling Date	Hydroxide	BODs	COD	TOC	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury
RC-3	01/07/88	0				0.01 <	0.43	0.01 <	12.8	0.045	0.0002 <
RC-3 1/2	03/02/88					0.011	4.2		17.2		0.0002 <
RC-4	12/21/88										
RC-4	06/02/88										
RC-4	04/25/88	0	1 <	5 <	13	0.01 <	0.15	0.01 <	26.9	0.01	<0.00022
RC-4	03/23/88					0.01 <	0.41		34.3		0.0002 <
RC-4	02/18/88					0.01 <	1.03		17.2		0.00029
RC-4	02/11/88	0				0.01 <	9.2	0.038	7.3	0.208	0.0002 <
RC-4	01/07/88	0				0.01 <	0.14	0.01 <	22.8	0.02	0.0002 <
RC-5 (=RC-A)	10/20/88										
RC-5 (=RC-A)	09/27/88	0	1 <	5 <	11.9	0.01 <	0.203	0.01 <	20.100	0.215	0.0002 <
RC-5 (=RC-A)	09/08/88										
RC-5 (=RC-A)	07/26/88										
RC-A	09/13/89										
RC-A	08/17/89										
RC-A	07/17/89	5.000 <					0.060	0.005 <	18.000	0.005 <	0.0001 <
RC-A	06/27/89										
RC-A	05/17/89										
RC-A	04/11/89	5.000 <					0.170	0.005 <	18.000	0.130	0.0001 <
RC-A	03/21/89										
RC-A	12/08/88										
RC-A	11/11/88	5.000 <					0.030	0.005 <	20.000	0.009	0.0001 <
SPD-1	09/25/87					0.26	1.34		29.4		0.0002 <

Well ID	Sampling Date	Nickel (T)	Nitrate	Nitrite	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T)
BC-A	05/19/89		0.050 <		0.090				
BC-A	04/11/89	0.010 <	0.050 <		0.110	2.400	0.005 <		11.000
BC-A	03/21/89		0.390		0.130				
BC-B	05/19/89								
BC-B	04/11/89	0.010 <	0.050 <		0.110	2.600	0.005 <		11.000
Bell Creek	03/10/88	0.033	0.048	0.013	0.19	3.1	0.0028	20.6 <	
Brush Creek	09/13/89								
Brush Creek	08/17/89								
Brush Creek	07/17/89	0.010 <	0.050 <		0.190	6.100	0.005 <		20.000
Brush Creek	06/27/89								
Brush Creek	05/17/89								
Brush Creek	04/12/89	0.010 <	0.060		0.310	3.400	0.005 <		9.800
Brush Creek	03/21/89								
Brush Creek	02/17/89								
Brush Creek	01/04/89	0.010 <	0.080		0.190	6.000	0.005 <		18.000
Brush Creek	12/08/88								
Brush Creek	11/11/88	0.010 <	0.050 <		0.140	6.600	0.005 <		19.000
Brush Creek	10/20/88								
Brush Creek	09/27/88	0.01 <	0.01 <	0.005 <	0.123	5.6	0.002 <	46.2	
Brush Creek	09/08/88								
Brush Creek	07/26/88								
Brush Creek	06/28/88	0.01 <	0.028	0.008	0.24	5.4	0.002 <	40.2	
Brush Creek	06/02/88								
Brush Creek	04/25/88	0.01 <	0.01 <	0.005 <	0.17	5.1	0.002 <	36.9	
Brush Creek	01/07/88	0.01 <	0.01 <	0.02	0.149	6.2	0.0021	39.4	
Brush Creek	10/15/87	0.02	0.096	0.025	0.147	8.9	0.0024	40.7	
RC-1 (=RC-B)	08/20/89								
RC-1 (=RC-B)	10/20/88								
RC-1 (=RC-B)	09/27/88	0.01 <	0.024	0.005 <	0.052	13.4	0.002 <	32.7	
RC-1 (=RC-B)	09/08/88								
RC-1 (=RC-B)	07/26/88								
RC-1 (=RC-B)	06/28/88	0.01 <	0.039	0.014	0.25	23.4	0.002 <	44	
RC-1 (=RC-B)	06/02/88								
RC-1 (=RC-B)	04/25/88	0.01 <	0.018	0.005 <	0.22	8.2	0.002 <	43.4	
RC-1 (=RC-B)	03/23/88								
RC-1 (=RC-B)	03/16/88								
RC-1 (=RC-B)	03/09/88								
RC-1 (=RC-B)	03/02/88								
RC-1 (=RC-B)	02/25/88								
RC-1 (=RC-B)	02/18/88								
RC-1 (=RC-B)	02/11/88								
RC-1 (=RC-B)	02/04/88								
RC-1 (=RC-B)	01/28/88								
RC-1 (=RC-B)	01/21/88								
RC-1 (=RC-B)	01/14/88								
RC-1 (=RC-B)	01/07/88								
RC-1 (=RC-B)	12/17/87								

Well ID	Sampling Date	Nickel (T)	Nitrate	Nitrite	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T)
RC-1 (=RC-B)	12/10/87								
RC-1 (=RC-B)	12/03/87								
RC-1 (=RC-B)	11/24/87								
RC-1 (=RC-B)	11/19/87								
RC-1 (=RC-B)	11/06/87								
RC-1 (=RC-B)	10/29/87								
RC-1 (=RC-B)	10/21/87								
RC-1 (=RC-B)	10/15/87								
RC-1 (=RC-B)	10/08/87								
RC-1 (=RC-B)	10/01/87								
RC-1 (=RC-B)	09/25/87								
RC-1 (=RC-B)	09/17/87								
RC-1 (=RC-B)	08/27/87								
RC-1 (=RC-B)	08/27/87								
RC-1 (=RC-B)	08/13/87								
RC-1 (=RC-B)	08/06/87								
RC-1 (=RC-B)	07/27/87								
RC-1 (=RC-B)	07/20/87								
RC-1 (=RC-B)	07/09/87								
RC-1 (=RC-B)	06/30/87	0.01 <	0.087	0.01	0.21	2.8	0.002 <	41	
RC-1 (=RC-B)	06/25/87								
RC-1 (=RC-B)	06/18/87								
RC-1 (=RC-B)	06/11/87								
RC-1 (=RC-B)	04/16/87	0.01 <	0.049	0.016	0.225	11.2	0.002 <	42.5	
RC-B	08/17/89								
RC-B	07/17/89	0.010 <	0.050 <		0.120	8.600	0.007		21.000
RC-B	06/27/89								
RC-B	05/17/89								
RC-B	04/11/89	0.010 <	0.110		0.290	6.600	0.005 <		14.000
RC-B	03/21/89								
RC-B	02/17/89								
RC-B	01/04/89	0.010 <	0.090		0.240	9.700	0.006		0.500 <
RC-B	12/08/88		0.330		0.410				
RC-B	11/11/88	0.010 <	0.050 <		0.220	8.400	0.012		20.000
RC-2 (=RC-C)	10/20/88		0.220		0.060				
RC-2 (=RC-C)	09/27/88	0.013	0.48	0.005 <	0.016	14.2	0.002 <	45.8	
RC-2 (=RC-C)	07/26/88								
RC-2 (=RC-C)	06/02/88								
RC-2 (=RC-C)	04/25/88	0.01 <	0.01 <	0.0059	0.23	11.2	0.002 <	39.9	
RC-2 (=RC-C)	03/23/88								
RC-2 (=RC-C)	03/16/88								
RC-2 (=RC-C)	03/09/88								
RC-2 (=RC-C)	03/02/88								
RC-2 (=RC-C)	01/28/88								
RC-2 (=RC-C)	01/21/88								
RC-2 (=RC-C)	01/14/88								
RC-2 (=RC-C)	01/07/88								

Well ID	Sampling Date	Nickel (T)	Nitrate	Nitrite	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T)
RC-2 (=RC-C)	12/30/87								
RC-2 (=RC-C)	12/17/87								
RC-2 (=RC-C)	12/10/87								
RC-2 (=RC-C)	12/03/87								
RC-2 (=RC-C)	11/24/87								
RC-2 (=RC-C)	11/19/87								
RC-2 (=RC-C)	11/06/87								
RC-2 (=RC-C)	10/29/87								
RC-2 (=RC-C)	10/21/87								
RC-2 (=RC-C)	10/15/87								
RC-2 (=RC-C)	10/08/87								
RC-2 (=RC-C)	10/01/87								
RC-2 (=RC-C)	09/25/87								
RC-2 (=RC-C)	09/17/87								
RC-2 (=RC-C)	09/03/87								
RC-2 (=RC-C)	08/27/87								
RC-2 (=RC-C)	08/20/87								
RC-2 (=RC-C)	08/13/87								
RC-2 (=RC-C)	08/06/87								
RC-2 (=RC-C)	07/30/87								
RC-2 (=RC-C)	07/27/87								
RC-2 (=RC-C)	07/16/87								
RC-2 (=RC-C)	07/09/87								
RC-2 (=RC-C)	06/30/87	0.01 <	1.7	0.052	0.025	3.8	0.002 <	35.7	
RC-2 (=RC-C)	06/25/87								
RC-2 (=RC-C)	06/18/87								
RC-2 (=RC-C)	06/11/87								
RC-2 (=RC-C)	04/16/87	0.01 <	4.73	0.017	0.174	15.6	0.002 <	38.7	
RC-C	07/17/89	0.010 <	0.220		0.080	16.000	0.010		8.900
RC-C	06/27/89								
RC-C	05/17/89								
RC-C	04/11/89	0.010 <	0.050 <		0.200	4.000	0.005 <		10.000
RC-C	03/21/89								
RC-C	01/04/89	0.070	8.200		0.170	17.000	0.026		18.000
RC-C	12/08/88		0.380		0.390				
RC-C	11/11/88	0.010 <	0.050 <		0.180	12.000	0.006		17.000
RC-3	10/20/88								
RC-3	09/27/88	0.01 <	0.39	0.005 <	0.172	9.6	0.002 <	46.5	
RC-3	09/08/88								
RC-3	07/26/88								
RC-3	06/28/88	0.01 <	0.11 <	0.005 <	0.23	8	0.002 <	54	
RC-3	06/02/88								
RC-3	04/25/88	0.01 <	0.01 <	0.011	0.2	5.5	0.002 <	40.9	
RC-3	03/23/88								
RC-3	03/02/88								
RC-3	02/18/88								
RC-3	02/11/88	0.01 <	0.13	0.046	0.269	7.8	0.0028	32.8	

Well ID	Sampling Date	Nickel (T)	Nitrate	Nitrite	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T)
RC-3	01/07/88	0.01 <	0.196	0.025	0.191	6.2	0.0034	40.7	
RC-3 1/2	03/02/88								
RC-4	12/21/88								
RC-4	06/02/88								
RC-4	04/25/88	0.02	0.022	0.01	0.15	7	0.002 <	25	
RC-4	03/23/88								
RC-4	02/18/88								
RC-4	02/11/88	0.02	0.33	0.065	0.874	6.9	0.002	23.8	
RC-4	01/07/88	0.01 <	0.013	0.014	0.108	10.7	0.0029	40.6	
RC-5 (=RC-A)	10/20/88		0.400		0.050				
RC-5 (=RC-A)	09/27/88	0.010 <	2.190	0.005 <	0.148	5.200	0.002 <	42.2	
RC-5 (=RC-A)	09/08/88								
RC-5 (=RC-A)	07/26/88								
RC-A	09/13/89		0.050 <		0.200				
RC-A	08/17/89		0.050 <		0.240				
RC-A	07/17/89	0.010 <	0.050 <		0.220	9.400	0.005 <		17.000
RC-A	06/27/89		0.070		0.150				
RC-A	05/17/89		0.050 <		0.090				
RC-A	04/11/89	0.010 <	2.400		0.020	7.300	0.005 <		14.000
RC-A	03/21/89		4.600		0.180				
RC-A	12/08/88		0.550		0.200				
RC-A	11/11/88	0.010 <	0.270		0.020 <	8.400	0.005 <		16.000
SPD-1	09/25/87								

Well ID	Sampling Date	Silver (T)	Sodium as	Sulfate as	Suspended Solids	Settleable Solids	Thallium
BC-A	05/19/89				6.000		
BC-A	04/11/89	0.005 <	7.300	19.000	11.000	0.200	0.005 <
BC-A	03/21/89				7.000		
BC-B	05/19/89						
BC-B	04/11/89	0.005 <	8.100	21.000	8.000	0.100 <	0.005 <
Bell Creek	03/10/88	0.01	31.1	103	171 <		0.01
Brush Creek	09/13/89						
Brush Creek	08/17/89						
Brush Creek	07/17/89	0.005 <	22.000	96.000	6.000	0.100	0.005 <
Brush Creek	06/27/89						
Brush Creek	05/17/89						
Brush Creek	04/12/89	0.005 <	14.000	45.000	28.000	0.300	0.005 <
Brush Creek	03/21/89						
Brush Creek	02/17/89						
Brush Creek	01/04/89	0.005 <	25.000	80.000	5.000 <	0.100 <	0.005 <
Brush Creek	12/08/88						
Brush Creek	11/11/88	0.005 <	27.000	76.000	5.000 <	0.100 <	0.005 <
Brush Creek	10/20/88						
Brush Creek	09/27/88	0.01 <	23.9	6.4	4.4		0.01 <
Brush Creek	09/08/88						
Brush Creek	07/26/88						
Brush Creek	06/28/88	0.01 <	24.2	78.9	1.4		0.01 <
Brush Creek	06/02/88						
Brush Creek	04/25/88	0.01 <	23.7	68	1 <		0.01 <
Brush Creek	01/07/88	0.01 <	25.2	68	16		0.01 <
Brush Creek	10/15/87	0.01 <	24.2	74	0.01 <		0.01 <
RC-1 (=RC-B)	08/20/89		38		1.2		
RC-1 (=RC-B)	10/20/88						
RC-1 (=RC-B)	09/27/88	0.01 <	71.8	405	7.6		0.01 <
RC-1 (=RC-B)	09/08/88						
RC-1 (=RC-B)	07/26/88						
RC-1 (=RC-B)	06/28/88	0.01 <	61.9	107	17		0.01 <
RC-1 (=RC-B)	06/02/88						
RC-1 (=RC-B)	04/25/88	0.01 <	37.6	79	1 <		0.01 <
RC-1 (=RC-B)	03/23/88		55.2		2310		
RC-1 (=RC-B)	03/16/88		47.8		4.8		
RC-1 (=RC-B)	03/09/88		52.3		16		
RC-1 (=RC-B)	03/02/88		43.8		23		
RC-1 (=RC-B)	02/25/88		38.2		63		
RC-1 (=RC-B)	02/18/88		30.1		9.2		
RC-1 (=RC-B)	02/11/88		34.2		101		
RC-1 (=RC-B)	02/04/88		42.8		8.5		
RC-1 (=RC-B)	01/28/88		37.2		2.4		
RC-1 (=RC-B)	01/21/88		38.1		3.2		
RC-1 (=RC-B)	01/14/88		44.1		13		
RC-1 (=RC-B)	01/07/88		36.8		1.6		
RC-1 (=RC-B)	12/17/87		36.6		12.4		

Well ID	Sampling Date	Silver (T)	Sodium as	Sulfate as	Suspended Solids	Settleable Solids	Thallium
RC-1 (=RC-B)	12/10/87		42.4		1 <		
RC-1 (=RC-B)	12/03/87		37.3		2		
RC-1 (=RC-B)	11/24/87		37.2		1 <		
RC-1 (=RC-B)	11/19/87		38.3		3.2		
RC-1 (=RC-B)	11/06/87		70.8		3.7		
RC-1 (=RC-B)	10/29/87		40.2		10		
RC-1 (=RC-B)	10/21/87		36.2		9.2		
RC-1 (=RC-B)	10/15/87		34.9		7.6		
RC-1 (=RC-B)	10/08/87		43.2		20		
RC-1 (=RC-B)	10/01/87		35.2		4.8		
RC-1 (=RC-B)	09/25/87		39.3		5.2		
RC-1 (=RC-B)	09/17/87		37.5		4.8		
RC-1 (=RC-B)	08/27/87		38		3.2		
RC-1 (=RC-B)	08/27/87		37		1 <		
RC-1 (=RC-B)	08/13/87		35		2		
RC-1 (=RC-B)	08/06/87		37		4		
RC-1 (=RC-B)	07/27/87		35.4		2		
RC-1 (=RC-B)	07/20/87		35.5		1 <		
RC-1 (=RC-B)	07/09/87				4		
RC-1 (=RC-B)	06/30/87	0.01 <	48.7	56	3.6		0.01 <
RC-1 (=RC-B)	06/25/87				2.8		
RC-1 (=RC-B)	06/18/87				2.8		
RC-1 (=RC-B)	06/11/87				6.8		
RC-1 (=RC-B)	04/16/87	0.01 <	41.2	83.6	1 <		0.01 <
RC-B	08/17/89						
RC-B	07/17/89	0.005 <	34.000	130.000	19.000	0.100 <	0.005
RC-B	06/27/89						
RC-B	05/17/89						
RC-B	04/11/89	0.005 <	26.000	66.000	52.000	0.400	0.005 <
RC-B	03/21/89						
RC-B	02/17/89						
RC-B	01/04/89	0.005 <	42.000	110.000	5.000 <	0.010 <	0.005 <
RC-B	12/08/88				2900.000		
RC-B	11/11/88	0.005 <	44.000	160.000	5.000 <	0.100 <	0.005 <
RC-2 (=RC-C)	10/20/88				24.000		
RC-2 (=RC-C)	09/27/88	0.01 <	78.1	380	3.2		0.01 <
RC-2 (=RC-C)	07/26/88						
RC-2 (=RC-C)	06/02/88						
RC-2 (=RC-C)	04/25/88	0.01 <	49.2	87	16		0.01 <
RC-2 (=RC-C)	03/23/88		50.2		8.4		
RC-2 (=RC-C)	03/16/88		52.3		6.8		
RC-2 (=RC-C)	03/09/88		51.8		195		
RC-2 (=RC-C)	03/02/88		68.7		431		
RC-2 (=RC-C)	01/28/88		85.2		12		
RC-2 (=RC-C)	01/21/88		89.9		8.4		
RC-2 (=RC-C)	01/14/88		90.8		19		
RC-2 (=RC-C)	01/07/88		88.7		10		

Well ID	Sampling Date	Silver (T)	Sodium as	Sulfate as	Suspended Solids	Settleable Solids	Thallium
RC-2 (=RC-C)	12/30/87		42.2		24		
RC-2 (=RC-C)	12/17/87		96.4		226		
RC-2 (=RC-C)	12/10/87		96.8		228		
RC-2 (=RC-C)	12/03/87		98.2		70		
RC-2 (=RC-C)	11/24/87		93.1		160		
RC-2 (=RC-C)	11/19/87		92.6		42		
RC-2 (=RC-C)	11/06/87		69.8		64		
RC-2 (=RC-C)	10/29/87		83.1		28		
RC-2 (=RC-C)	10/21/87		76.5		2		
RC-2 (=RC-C)	10/15/87		73.9		19		
RC-2 (=RC-C)	10/08/87		72.6		25		
RC-2 (=RC-C)	10/01/87		73.9		322		
RC-2 (=RC-C)	09/25/87		78.4		18		
RC-2 (=RC-C)	09/17/87		74.4		16		
RC-2 (=RC-C)	09/03/87		81		31		
RC-2 (=RC-C)	08/27/87		80		60		
RC-2 (=RC-C)	08/20/87		75		14		
RC-2 (=RC-C)	08/13/87		73		8		
RC-2 (=RC-C)	08/06/87		80		14		
RC-2 (=RC-C)	07/30/87		77.2		6		
RC-2 (=RC-C)	07/27/87		81.2		5.2		
RC-2 (=RC-C)	07/16/87				4		
RC-2 (=RC-C)	07/09/87				6		
RC-2 (=RC-C)	06/30/87	0.01 <	40.1	106	59		0.01 <
RC-2 (=RC-C)	06/25/87				5.2		
RC-2 (=RC-C)	06/18/87				16		
RC-2 (=RC-C)	06/11/87				22		
RC-2 (=RC-C)	04/16/87	0.01 <	139	196	8.5		0.01 <
RC-C	07/17/89	0.005 <	52.000	94.000	21.000	0.100 <	0.005 <
RC-C	06/27/89						
RC-C	05/17/89						
RC-C	04/11/89	0.005 <	15.000	40.000	19.000	0.200	0.005 <
RC-C	03/21/89						
RC-C	01/04/89	0.005 <	130.000	1100.000	10.000	0.010 <	0.005 <
RC-C	12/08/88				14000.0		
RC-C	11/11/88	0.005 <	53.000	120.000	6.000	0.100	0.005 <
RC-3	10/20/88						
RC-3	09/27/88	0.01 <	57.8	12.5	11		0.01 <
RC-3	09/08/88						
RC-3	07/26/88						
RC-3	06/28/88	0.01 <	46.5	48.4	2.8		0.01 <
RC-3	06/02/88						
RC-3	04/25/88	0.01 <	40.2	29	48		0.01 <
RC-3	03/23/88		43.7		4.8		
RC-3	03/02/88		41.2		20		
RC-3	02/18/88		38.2		38		
RC-3	02/11/88	0.05	37.4	42.5	71		0.01 <

Well ID	Sampling Date	Silver (T)	Sodium as	Sulfate as	Suspended Solids	Settleable Solids	Thallium
RC-3	01/07/88	0.01	37.4	52	6.8		0.01 <
RC-3 1/2	03/02/88		40.2		97		
RC-4	12/21/88						
RC-4	06/02/88						
RC-4	04/25/88	0.01 <	44.2	85	3.2		0.01 <
RC-4	03/23/88		45.4		5.6		
RC-4	02/18/88		35.2		19		
RC-4	02/11/88	0.02	26.7	36.4	110		0.01 <
RC-4	01/07/88	0.01 <	43.9	113	11		0.01 <
RC-5 (=RC-A)	10/20/88				5.000 <		
RC-5 (=RC-A)	09/27/88	0.010	60.700	14.700	6.800		0.010 <
RC-5 (=RC-A)	09/08/88						
RC-5 (=RC-A)	07/26/88						
RC-A	09/13/89				5.000 <		
RC-A	08/17/89				6.000		
RC-A	07/17/89	0.005 <	56.000	83.000	5.000 <	0.100 <	0.005 <
RC-A	06/27/89				5.000 <		
RC-A	05/17/89				11.000		
RC-A	04/11/89	0.005 <	75.000	86.000	13.000	0.200	0.005 <
RC-A	03/21/89				49.000		
RC-A	12/08/88				9.000		
RC-A	11/11/88	0.005 <	57.000	91.000	5.000 <	0.100 <	0.005 <
SPD-1	09/25/87		93.2		47		

Well ID	Sampling Date	Total Dissolved Solids	THF	Turbidity	Zinc (T)	pH Units	Cations	Anions
BC-A	05/19/89		1 <	1.300		8.6		
BC-A	04/11/89	120.000		18.000	0.022	8.5		
BC-A	03/21/89		1 <	9.000		8.3		
BC-B	05/19/89					8.3		
BC-B	04/11/89	120.000		15.000	0.021	8.5		
Bell Creek	03/10/88	107		24	0.298	8.18	5.18	5.12
Brush Creek	09/13/89					8.2		
Brush Creek	08/17/89					7.9		
Brush Creek	07/17/89	190.000		1.500	0.005 <	8.2		
Brush Creek	06/27/89					8.3		
Brush Creek	05/17/89					8.4		
Brush Creek	04/12/89	210.000		10.000	0.013	8.1		
Brush Creek	03/21/89					8.2		
Brush Creek	02/17/89					8.1		
Brush Creek	01/04/89	340.000		0.500	0.005 <	8.0		
Brush Creek	12/08/88					8.2		
Brush Creek	11/11/88	340.000		0.400	0.005	8.3		
Brush Creek	10/20/88					8.0		
Brush Creek	09/27/88	375		0.55	0.01 <	7.98	3.78	4.05
Brush Creek	09/08/88					8.28		
Brush Creek	07/26/88					7.73		
Brush Creek	06/28/88	340		0.9	0.01 <	7.76	5.99	5.45
Brush Creek	06/02/88					8.11		
Brush Creek	04/25/88	313		1.2	0.01 <	8.12	4.67	5.03
Brush Creek	01/07/88	365		4.9	0.06	8.16	5.52	5.44
Brush Creek	10/15/87	308		4.2	0.18	8.06	5.56	5.67
RC-1 (=RC-B)	08/20/89			0.62		8.39		
RC-1 (=RC-B)	10/20/88					8.1		
RC-1 (=RC-B)	09/27/88	915		0.64	0.018	8.12	12.93	13.34
RC-1 (=RC-B)	09/08/88					8.32		
RC-1 (=RC-B)	07/26/88					8.01		
RC-1 (=RC-B)	06/28/88	509		14	0.033	8.34	8.39	7.64
RC-1 (=RC-B)	06/02/88					8.55		
RC-1 (=RC-B)	04/25/88	386		1.3	0.01 <	8.52	5.95	6.15
RC-1 (=RC-B)	03/23/88			320		7.84		
RC-1 (=RC-B)	03/16/88			1.8		8.45		
RC-1 (=RC-B)	03/09/88			6.8		8.42		
RC-1 (=RC-B)	03/02/88			17		8.25		
RC-1 (=RC-B)	02/25/88			48		8.29		
RC-1 (=RC-B)	02/18/88			5.1		8.19		
RC-1 (=RC-B)	02/11/88			84		8.06		
RC-1 (=RC-B)	02/04/88			7.8		8.29		
RC-1 (=RC-B)	01/28/88			2.6		8.3		
RC-1 (=RC-B)	01/21/88			1.2		8.22		
RC-1 (=RC-B)	01/14/88			6.8		8.17		
RC-1 (=RC-B)	01/07/88			1.1		8.15		
RC-1 (=RC-B)	12/17/87			1.6		8.3		

Well ID	Sampling Date	Total Dissolved Solids	THP	Turbidity	Zinc (T)	pH Units	Cations	Anions
RC-1 (=RC-B)	12/10/87			1.5		8.28		
RC-1 (=RC-B)	12/03/87			0.86		7.68		
RC-1 (=RC-B)	11/24/87			0.73		8.55		
RC-1 (=RC-B)	11/19/87			1.2		8.4		
RC-1 (=RC-B)	11/06/87			4.4		8.32		
RC-1 (=RC-B)	10/29/87			1.6		8.17		
RC-1 (=RC-B)	10/21/87			4.7		8.01		
RC-1 (=RC-B)	10/15/87			4.7		8.06		
RC-1 (=RC-B)	10/08/87			25		8.23		
RC-1 (=RC-B)	10/01/87			3.1		8.37		
RC-1 (=RC-B)	09/25/87			0.35		8.72		
RC-1 (=RC-B)	09/17/87			0.5		8.59		
RC-1 (=RC-B)	08/27/87			0.48		8.66		
RC-1 (=RC-B)	08/27/87			0.6		8.28		
RC-1 (=RC-B)	08/13/87			0.76		8.36		
RC-1 (=RC-B)	08/06/87			0.74		8.48		
RC-1 (=RC-B)	07/27/87			1.1		8.45		
RC-1 (=RC-B)	07/20/87			0.56		8.22		
RC-1 (=RC-B)	07/09/87			1.4		8.32		
RC-1 (=RC-B)	06/30/87	420		0.59	0.01 <	8.44	5.56	5.95
RC-1 (=RC-B)	06/25/87			0.58		8.39		
RC-1 (=RC-B)	06/18/87			1.6		8.51		
RC-1 (=RC-B)	06/11/87			3.4		8.42		
RC-1 (=RC-B)	04/16/87	427		0.46	0.01 <	8.32	7.06	6.92
RC-B	08/17/89							
RC-B	07/17/89	360.000		9.500	0.005 <	9.1		
RC-B	06/27/89					9.1		
RC-B	05/17/89					9.1		
RC-B	04/11/89	270.000		15.000	0.015	8.2		
RC-B	03/21/89					8.7		
RC-B	02/17/89					8.2		
RC-B	01/04/89	430.000		3.000	0.005 <	8.2		
RC-B	12/08/88			1500.000		8.5		
RC-B	11/11/88	500.000		3.500	0.005 <	8.4		
RC-2 (=RC-C)	10/20/88		1 <	17.000		8.4		
RC-2 (=RC-C)	09/27/88	795		0.21	0.11	8.1	12.49	12.71
RC-2 (=RC-C)	07/26/88					8.63		
RC-2 (=RC-C)	06/02/88					8.65		
RC-2 (=RC-C)	04/25/88	429		19	0.01 <	8.5	6.68	6.72
RC-2 (=RC-C)	03/23/88			1.8		8.38		
RC-2 (=RC-C)	03/16/88			2.9		8.35		
RC-2 (=RC-C)	03/09/88			98		8.31		
RC-2 (=RC-C)	03/02/88		>	1000		8.19		
RC-2 (=RC-C)	01/28/88			4.6		8.27		
RC-2 (=RC-C)	01/21/88			2.5		8.03		
RC-2 (=RC-C)	01/14/88			4.5		7.99		
RC-2 (=RC-C)	01/07/88			3.3		8.18		

Well ID	Sampling Date	Total Dissolved Solids	THP	Turbidity	Zinc (T)	pH Units	Cations	Anions
RC-2 (=RC-C)	12/30/87			8		7.93		
RC-2 (=RC-C)	12/17/87			61		7.88		
RC-2 (=RC-C)	12/10/87			62		8.27		
RC-2 (=RC-C)	12/03/87			26		7.72		
RC-2 (=RC-C)	11/24/87			68		8.12		
RC-2 (=RC-C)	11/19/87			18		8.23		
RC-2 (=RC-C)	11/06/87			82		8.01		
RC-2 (=RC-C)	10/29/87			9.1		8.21		
RC-2 (=RC-C)	10/21/87			1.1		8.16		
RC-2 (=RC-C)	10/15/87			6.7		8.16		
RC-2 (=RC-C)	10/08/87			17		7.96		
RC-2 (=RC-C)	10/01/87			260		8.38		
RC-2 (=RC-C)	09/25/87			6.9		8.5		
RC-2 (=RC-C)	09/17/87			7.5		8.52		
RC-2 (=RC-C)	09/03/87			17		8.04		
RC-2 (=RC-C)	08/27/87			22		8.39		
RC-2 (=RC-C)	08/20/87			4.7		8.49		
RC-2 (=RC-C)	08/13/87			1.6		8.25		
RC-2 (=RC-C)	08/06/87			7.5		8.3		
RC-2 (=RC-C)	07/30/87			5.2		8.32		
RC-2 (=RC-C)	07/27/87			6		8.48		
RC-2 (=RC-C)	07/16/87			5.4		8.33		
RC-2 (=RC-C)	07/09/87			5.1		7.98		
RC-2 (=RC-C)	06/30/87	597		32	0.018	8.54	10.71	10.34
RC-2 (=RC-C)	06/25/87			2.2		8.32		
RC-2 (=RC-C)	06/18/87			5.4		8.93		
RC-2 (=RC-C)	06/11/87			18		8.65		
RC-2 (=RC-C)	04/16/87	787		0.32 <	0.01	8.56	13.96	14.08
RC-C	07/17/89	400.000		8.700	0.005	9.2		
RC-C	06/27/89					8.5		
RC-C	05/17/89					9.4		
RC-C	04/11/89	180.000		8.000	0.013	8.7		
RC-C	03/21/89					8.6		
RC-C	01/04/89	1900.000		4.500	0.023	8.0		
RC-C	12/08/88			1400.000		8.4		
RC-C	11/11/88	480.000		4.000	0.005 <	8.5		
RC-3	10/20/88					8.3		
RC-3	09/27/88	484		2.6	0.243	8.21	6.06	5.9
RC-3	09/08/88					8.31		
RC-3	07/26/88					8.06		
RC-3	06/28/88	364		6.4	0.093	8.03	5.09	5.19
RC-3	06/02/88					8.38		
RC-3	04/25/88	291		42	0.015	8.35	4.08	4.48
RC-3	03/23/88			2.3		8.34		
RC-3	03/02/88			15		8.95		
RC-3	02/18/88			17		8.17		
RC-3	02/11/88	158		105	0.112	7.96	3.97	3.95

Well ID	Sampling Date	Total Dissolved Solids	THF	Turbidity	Zinc (T)	pH Units	Cations	Anions
RC-3	01/07/88	304		4.4	0.05	7.88	4.65	4.86
RC-3 1/2	03/02/88			37		8.96		
RC-4	12/21/88					8.4		
RC-4	06/02/88					9.34		
RC-4	04/25/88	329		5	0.01 <	9.03	5.57	5.24
RC-4	03/23/88			2.5		8.42		
RC-4	02/18/88			19		7.93		
RC-4	02/11/88	266		170	0.115	7.57	4.67	4.88
RC-4	01/07/88	431		3	0.025	8.76	6.72	6.85
RC-5 (=RC-A)	10/20/88		1 <	4.500		8.2		
RC-5 (=RC-A)	09/27/88	527.000		1.800	0.220	7.48	5.94	5.7
RC-5 (=RC-A)	09/08/88					8.13		
RC-5 (=RC-A)	07/26/88					8.01		
RC-A	09/13/89		1 <	0.050		8.3		
RC-A	08/17/89		1 <	2.000		8.1		
RC-A	07/17/89	400.000		0.800	0.005 <	8.3		
RC-A	06/27/89		1 <	0.750		8.4		
RC-A	05/17/89		1 <	3.800		10		
RC-A	04/11/89	470.000		202.000	0.005 <	8.7		
RC-A	03/21/89		1 <	20.000		8.6		
RC-A	12/08/88			9.200		7.9		
RC-A	11/11/88	430.000	1 <	0.700	0.005	8.1		
SPD-1	09/25/87			25		8.22		

D-2 - Groundwater Database

BARRICK GOLD STRIKE - GROUNDWATER DATA BASE
ENSR PROJECT NUMBER: 0730-001-202
FILE NAME: GW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
AA WELL	07/14/89	120	0.1 <	0.2 <	0.088	0.05 <	150	0.1 <	
AA WELL	04/06/89	139	0.1 <	0.2	0.097	0.02	160	0.1 <	
AA WELL	01/12/89	130	0.1 <	0.2 <	0.097	0.05	160	0.1 <	
AA WELL	11/21/88	340	3.2	0.2 <	0.3	0.11	410	0.5	
AA WELL	09/27/88	127	0.1 <	0.1 <	0.076	0.03	155	0.05 <	0.01 <
AA WELL	06/29/88	135	0.1 <	0.1 <	0.06	0.01 <	164	0.09	0.01 <
AA WELL	04/26/88	138	0.1 <	0.12	0.04	0.055	168	0.13	0.01 <
AA WELL	01/28/88	129	0.1 <	2.8	0.053	0.01 <	158	0.075	0.01
AA WELL	12/29/87				0.082				
AA WELL	12/29/87				0.064				
AA WELL	10/28/87				0.038				
AA WELL	10/28/87				0.078				
AA WELL	09/17/87	122	0.1 <	0.26	0.01 <	0.045	148	0.078	0.01 <
AA WELL	08/06/87	127	0.1 <	0.1 <	0.01 <	0.045	155	0.18	0.01 <
AA WELL	06/30/87	133	0.1 <	0.11	0.01 <	0.09	169	0.16	0.01 <
AA WELL	06/15/87	129	0.1 <	0.1 <	0.013	0.11	157	0.16	0.01 <
AA WELL	09/24/87	226	0.01 <	0.32	0.01 <	0.045	275	0.077	0.01 <
BAZZA WELL	11/10/88	480	0.1 <	1.2	0.01	0.14	580	0.8	
BAZZA WELL	09/27/88	358	0.1	<0.06451	0.042	0.23	433	0.9	0.01 <
BAZZA WELL	06/29/88	461	0.48	1.94	0.046	0.01 <	562	0.88	0.01 <
BAZZA WELL	04/25/88	286	0.1 <	1.07	0.095	0.305	348	1.03	0.01 <
BAZZA WELL	02/25/88	165	0.1 <	0.16	0.039	0.08	201	0.115	0.01 <
BAZZA WELL	06/30/87	471	0.1 <	2.68	0.01 <	0.05	575	0.84	0.01 <
BAZZA PIT	09/27/88	403	0.1 <	4.02	0.129	0.168	480	0.88	0.01 <
BAZZA PIT	06/28/88	330	0.1 <	0.1 <	0.183	0.01 <	403	0.85	0.01 <
BAZZA PIT	04/25/88	263	0.1 <	0.11	0.069	0.095	313	1.1	0.01 <
BAZZA PIT	06/30/87	176	0.1 <	0.1 <	0.012	0.045	212	0.64	0.01 <
BAZZA PIT	04/16/87	264	0.07	0.19	0.01 <	0.072	315	0.79	0.01 <
BAZZA WELL	07/14/89	420	0.1 <	1.5	0.013	0.15	510	0.9	
BAZZA WELL	04/06/89	480	0.1 <	2.4	0.01	0.13	590	0.9	
BAZZA WELL	01/12/89	520	0.1 <	0.9	0.018	0.8	630	0.15	
BAZZA WELL	01/12/89	520	0.1 <	0.9	0.018	0.15	630	0.8	
BAZZA WELL	11/10/88	480	0.1 <	1.2	0.01	0.14	580	0.8	
BW-1	11/30/88	480	0.1 <	1.4	0.58	0.17	580	0.9	
BW-1	11/21/88	440	0.1 <	0.5	0.67	0.14	540	0.8	
BW-1	11/10/88	300	0.1 <	1.1	0.73	0.12	370	0.8	
BW-1	11/02/88	430	0.1 <	0.8	0.9	0.14	520	0.8	
BW-1	10/05/88	420	0.1 <	2	1.1	0.16	510	0.9	
BWD-1	06/25/87	451	0.093	1.18	0.022	0.14	521	0.63	0.01 <
GWOP-6	03/10/89								
GWOP-6	03/06/89								
GWOP-6	02/24/89	120	8.6	0.2 <	0.062	0.18	150	0.2	
GWOP 6	06/29/88	194	20.7	0.14	0.077	0.63	237	0.26	0.01 <
GWOP 6	06/09/88								
GWOP 6	06/09/88				0.038				
GWOP 6	04/26/88				0.062				
GWOP 6	03/02/88				0.029				

BARRICK GOLD STRIKE - GROUNDWATER DATA BASE
ENSR PROJECT NUMBER: 0730-001-202
FILE NAME: GW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
GWOF 6	01/28/88	140	0.1 <	4.07	0.018	0.93	170	0.183	0.01 <
GWOF-10	09/29/89				0.014				
GWOF-10	08/17/89				0.016				
GWOF-10	07/19/89	170	0.1 <	0.31	0.017	0.19	200	0.3	
GWOF-10	06/29/89	170	0.1 <	0.3	0.012	0.2	200	0.2	
GWOF-10	05/17/89				0.017				
GWOF-10	04/12/89	160	0.1 <	0.2 <	0.016	0.18	200	0.2	
GWOF-10	03/22/89				0.017				
GWOF-10	02/28/89				0.023				
GWOF-10	01/27/89	200	6.3	0.2 <	0.02	0.3	250	0.27	
GWOF-10	12/21/88				0.06				
GWOF-10	11/22/88	180	40	0.2	0.084	1.1	30	0.5	
GWOF-11	09/29/89				0.024				
GWOF-11	08/17/89				0.02				
GWOF-11	07/25/89	180	0.1 <	0.2 <	0.02	0.19	210	0.2	
GWOF-11	06/29/89	190	0.1 <	0.2 <	0.015	0.21	220	0.2	
GWOF-11	05/17/89				0.02				
GWOF-11	04/12/89	180	0.1	0.2 <	0.021	0.18	210	0.2	
GWOF-11	03/22/89				0.023				
GWOF-11	02/28/89				0.032				
GWOF-11	02/28/89				0.032				
GWOF-11	01/27/89	130	10	0.2 <	0.044	0.45	93	0.37	
GWOF-11	12/21/88				0.02				
GWOF-11	11/22/88	200	8.9	0.2 <	0.045	0.4	170	0.3	
GWOF-2	08/31/89				3.1				
GWOF-2	07/14/89	120	2.4	0.2 <	0.4	0.1	140	0.2	
GWOF-2	06/30/89				0.5				
GWOF-2	05/23/89				0.56				
GWOF-2	04/28/89	99	0.6	0.2 <	0.61	0.08	110	0.1	
GWOF-2	03/24/89				0.8				
GWOF-2	02/28/89				0.8				
GWOF-2	09/08/88								
GWOF-4	08/31/89				0.12				
GWOF-4	07/14/89	210	1.6	0.2 <	0.2	0.19	260	0.2	
GWOF-4	06/30/89				0.26				
GWOF-4	05/23/89	220	14	0.02 <	0.61	0.56	270	0.2	
GWOF-4	02/28/89	200	1.4	0.2 <	0.11	0.15	240	0.2	
GWOF-4	12/21/88				0.56				
GWOF-4	11/21/88	180	15	0.2 <	0.34	0.45	220	0.1	
GWOF-4	10/21/88				0.43				
GWOF-4	09/28/88	198	4.88	0.54	7.26	0.748	242	0.14	0.01 <
GWOF-4	09/08/88				2.45				
GWOF-4	07/28/88				0.221				
GWOF-4	06/29/88	187	27	0.12	0.063	0.7	224	0.15	0.01 <
GWOF-4	06/09/88				0.048				
GWOF-4	06/09/88				0.012				
GWOF-4	04/26/88				0.058				

BARRICK GOLD STRIKE - GROUNDWATER DATA BASE
ENSR PROJECT NUMBER: 0730-001-202
FILE NAME: GW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
GWOP-4	03/02/88				0.02				
GWOP-5	03/23/88				0.042				
FANCANA	03/02/88	147	0.1 <	0.42	0.042	0.053	180	0.17	0.01 <
FANCANA	07/22/86	160			0.051	0.2	195		
FPQ #3	11/30/88	300	0.1 <	1.4	0.2	0.24	360	0.5	
FPW #1	01/04/89	210	0.1	0.2 <	0.49	0.09	260	0.2	
FPW #2	05/23/89	210	0.01 <	0.2 <	0.33	0.07	250	0.26	
FPW #3	11/30/88	300	0.1 <	1.4	0.2	0.24	360	0.5	
FPW #5	09/11/89	210	0.01 <	0.2 <	0.58	0.05 <	260	0.2	
FPW #6	10/09/89	440	0.01 <	2.2	0.25	0.21	540	0.8	
FPW-6A	07/20/89	350	0.01 <	0.8	0.01	0.08	420	0.8	
FUPW-2	03/24/88	200	0.1 <	0.1 <	0.045	0.235	244	0.2	0.01 <
FUPW-2	03/16/88	174	0.1 <	0.1 <	0.055	0.15	212	0.19	0.01 <
FUPW-2	03/09/88	173	0.1 <	0.1 <	0.033	0.105	211	0.19	0.01 <
FUPW-2	03/02/88	168	0.1 <	0.28	0.057	0.068	206	0.19	0.01 <
FUPW-2	02/25/88	420	0.1 <	1.56	0.069	0.22	512	0.811	0.01 <
FUPW-2	02/18/88	163	0.1 <	0.24	0.044	0.08	198	0.098	0.01 <
FUPW-2	02/11/88	162	0.1 <	0.11	0.033	0.025	198	0.129	0.01 <
F-181	03/24/88	179	0.1 <	0.12	0.043	0.178	218	0.2	0.01 <
F-181	03/16/88	190	0.1 <	0.1 <	0.04	0.12	232	0.18	0.01 <
F-181	03/09/88	162	0.1 <	0.1 <	0.046	0.12	197	0.16	0.01 <
F-181	03/02/88	151	0.1 <	0.21	0.04	0.11	184	0.16	0.01 <
F-181	09/11/87	135	0.1 <	0.11	0.1 <	0.033	164	0.095	0.01 <
F-181	09/10/87	134	0.1 <	0.17	0.1 <	0.03	163	0.093	0.01 <
F-181	09/08/87	134	0.1 <	0.33	0.1 <	0.022	164	0.091	0.01 <
F-181	09/04/87	141	0.1 <	0.34	0.1 <	0.02	172	0.093	0.01 <
RC-4	12/21/88				0.16				
W BAZZA PIT	07/14/89	420	0.1 <	0.2 <	0.061	0.11	510	0.9	
W BAZZA PIT	04/26/89	430	0.1 <	0.5	0.055	0.1	520	0.9	
W BAZZA PIT	01/05/89	330	0.1	0.2	0.1	0.1	400	0.7	
W BAZZA PIT	11/10/88	310	0.1 <	0.2 <	0.095	0.09	380	0.8	
W BAZZA PIT	04/16/87	409	0.16	0.65	0.013	0.092	499	0.84	0.01 <
W #9 PIT	07/14/89	320	0.2	0.2 <	0.1	0.1	390	0.9	
W #9 PIT	04/06/89	370	0.1 <	0.4	0.068	0.11	440	0.9	
W #9 PIT	01/05/89	330	0.4	0.2 <	0.2	0.11	400	0.7	
W #9 PIT	11/10/88	310	0.1 <	0.7	0.59	0.13	370	0.8	
W #9 PIT	09/27/88	358	0.1 <	2.09	0.134	0.128	422	0.89	0.01 <
W #9 PIT	06/28/88	320	0.42	0.62	0.089	0.01 <	386	0.91	0.01 <
W #9 PIT	04/25/88	254	0.1 <	0.1 <	0.088	0.22	300	1.1	0.01 <
W #9 PIT	02/18/88	216	0.1 <	0.24	0.088	0.092	248	0.547	0.01 <
W #9 PIT	06/30/87	308	0.18	1.29	0.018	0.065	360	0.76	0.01 <
W #9 PIT	04/16/87	325	0.21	0.29	0.01 <	0.105	396	0.79	0.01 <
WW1	11/10/88	130	0.1 <	0.2 <	0.067	0.05 <	160	0.1	
WW1	09/27/88	141	0.1 <	0.25	0.039	0.108	167	0.11	0.01 <
WW1	06/30/88	155	0.1 <	0.1 <	0.043	0.01 <	189	0.14	0.01 <
WW1	04/26/88				0.038				
WW1	10/26/87				0.024				

BARRICK GOLD STRIKE - GROUNDWATER DATA BASE
ENSR PROJECT NUMBER: 0730-001-202
FILE NAME: GW-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
WW1	06/30/87	145	0.1 <	0.12	0.01 <	0.06	177	0.16	0.01 <
WW1	06/11/87								
WW1	04/16/87	147	0.12	0.31	0.01 <	0.01 <	179	0.20	0.01 <

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
AA WELL	07/14/89	34	5 <	18		0.005 <	400	0.005 <	0.005 <
AA WELL	04/06/89	34	5 <	17		0.005 <	400	0.005 <	0.005 <
AA WELL	01/12/89	34	5 <	17		0.005 <	450	0.012	0.005 <
AA WELL	11/21/88	61	5 <	15		0.005 <	720	0.016	0.005 <
AA WELL	09/27/88	7.8	0	10.1	0.01 <	0.01 <	411	0.01 <	0.002 <
AA WELL	06/29/88	33.9	0	14.8	0.01 <	0.01 <	406	0.053	0.002 <
AA WELL	04/26/88	15.4	0	20	0.01 <	0.01 <	380	0.01 <	0.002 <
AA WELL	01/28/88	7.5	0	20.1	0.01 <	0.01 <	392	0.01 <	0.002 <
AA WELL	12/29/87								
AA WELL	12/29/87								
AA WELL	10/28/87								
AA WELL	10/28/87								
AA WELL	09/17/87	38	0	20.7	0.01 <	0.01 <	406	0.035	0.002 <
AA WELL	08/06/87	10.8	0	35.2	0.01 <	0.01 <	408	0.028	0.002 <
AA WELL	06/30/87	34.2	0	20.1	0.01 <	0.01 <	424	0.045	0.002 <
AA WELL	06/15/87	13.1	0	17.5	0.01 <	0.01 <	414	0.01 <	0.002 <
AA WELL	09/24/87	42.8	0	4.3	0.01 <	0.01 <	655	0.01 <	0.002 <
BAZZA WELL	11/10/88	94	5 <	14		0.005 <	1100	0.005 <	0.005 <
BAZZA WELL	09/27/88	113	0	14.5	0.01 <	0.01 <	782	0.013	0.002 <
BAZZA WELL	06/29/88	85.2	0	11	0.01 <	0.01 <	990	0.01 <	0.005
BAZZA WELL	04/25/88	81.3	0	13	0.01 <	0.01 <	926	0.308	0.002 <
BAZZA WELL	02/25/88	65.6	0	44.1	0.01 <	0.01 <	663	0.01 <	0.0038
BAZZA WELL	06/30/87	112	0	13.2	0.01 <	0.01 <	795	0.01 <	0.002 <
BAZZA PIT	09/27/88	96.1	0	15.6	0.01 <	0.013	913	0.013	0.01
BAZZA PIT	06/28/88	64.2	0	12.8	0.01 <	0.01 <	881	0.01 <	0.002 <
BAZZA PIT	04/25/88	77.6	0	16.4	0.01 <	0.01 <	910	0.01 <	0.006
BAZZA PIT	06/30/87	104	0	20.7	0.01 <	0.01 <	1020	0.01 <	0.003
BAZZA PIT	04/16/87	52.5	3.8	18	0.01 <	0.01 <	816	0.01 <	0.002 <
BAZZA WELL	07/14/89	100	5 <	13		0.005 <	870	0.005 <	0.005 <
BAZZA WELL	04/06/89	100	5 <	13		0.005 <	970	0.005 <	0.005 <
BAZZA WELL	01/12/89	100	5 <	13		0.005 <	1100	0.005 <	0.005 <
BAZZA WELL	01/12/89	100	5 <	13		0.005 <	1100	0.005 <	0.005 <
BAZZA WELL	11/10/88	94	5 <	14		0.005 <	1100	0.005 <	0.005 <
BW-1	11/30/88	94	5 <	18		0.005 <	700	0.005 <	0.005 <
BW-1	11/21/88	87	5 <	13		0.005 <	950	0.005 <	0.005 <
BW-1	11/10/88	89	5 <	16		0.005 <	1100	0.005 <	0.005 <
BW-1	11/02/88	87	5 <	13		0.005 <	990	0.005 <	0.005 <
BW-1	10/05/88	96	5 <	13		0.005 <	5000	0.005 <	0.005 <
BWD-1	06/25/87	100	14	20.4	0.01 <	0.01 <	930	0.012	0.002 <
GWOF-6	03/10/89								1.2
GWOF-6	03/06/89								6.4
GWOF-6	02/24/89	46	5 <	72		0.006	860	0.048	0.14
GWOF 6	06/29/88	48.9	0	85.4	0.01 <	0.01 <	1010	0.05	0.064
GWOF 6	06/09/88								0.097
GWOF 6	06/09/88						1386		0.188
GWOF 6	04/26/88						646		0.009
GWOF 6	03/02/88						644		0.019

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
GWOF 6	01/28/88	7	0	17.9	0.01 <	0.08	363	0.46	0.016
GWOF-10	09/29/89						510		0.005 <
GWOF-10	08/17/89						570		0.005 <
GWOF-10	07/19/89	45	5 <	37		0.005 <	530	0.005 <	0.005 <
GWOF-10	06/29/89	43	5 <	36		0.005 <	550	0.005 <	0.005 <
GWOF-10	05/17/89						540		0.005 <
GWOF-10	04/12/89	43	5 <	38		0.005 <	550	0.005 <	0.005 <
GWOF-10	03/22/89						550		0.005 <
GWOF-10	02/28/89						540		0.005 <
GWOF-10	01/27/89	42	5 <	39		0.005 <	730	0.009	0.005 <
GWOF-10	12/21/88						520		0.006
GWOF-10	11/22/88	36	93	32		0.066	670	0.059	0.008
GWOF-11	09/29/89						620		0.005 <
GWOF-11	08/17/89						560		0.005 <
GWOF-11	07/25/89	38	5 <	32		0.005 <	540	0.005 <	0.005 <
GWOF-11	06/29/89	46	5 <	30		0.005 <	560	0.005 <	0.005 <
GWOF-11	05/17/89						540		0.005 <
GWOF-11	04/12/89	44	5 <	31		0.005 <	560	0.005 <	0.005 <
GWOF-11	03/22/89						560		0.005 <
GWOF-11	02/28/89						560		0.005
GWOF-11	02/28/89						560		0.005
GWOF-11	01/27/89	21	32	35		0.005 <	650	0.02	0.005 <
GWOF-11	12/21/88						550		0.005 <
GWOF-11	11/22/88	19	34	33		0.008	480	0.02	0.005 <
GWOF-2	08/31/89						840		0.073
GWOF-2	07/14/89	82	5 <	37		0.007	830	0.027	0.076
GWOF-2	06/30/89						860		0.077
GWOF-2	05/23/89						930		0.084
GWOF-2	04/28/89	92	6	43		0.005 <	970	0.008	0.089
GWOF-2	03/24/89						920		0.074
GWOF-2	02/28/89						960		0.068
GWOF-2	09/08/88								0.017
GWOF-4	08/31/89						530		0.005 <
GWOF-4	07/14/89	56	5 <	25		0.009	550	0.035	0.005 <
GWOF-4	06/30/89						560		0.005 <
GWOF-4	05/23/89	71	5 <	25		0.038	580	0.15	0.005 <
GWOF-4	02/28/89	60	5 <	22		0.005 <	590	0.026	0.005 <
GWOF-4	12/21/88						450		0.005 <
GWOF-4	11/21/88	50	5 <	21		0.014	510	0.13	0.005 <
GWOF-4	10/21/88						550		0.005 <
GWOF-4	09/28/88	33.1	0	28.5	0.01 <	0.03	510	0.13	0.002 <
GWOF-4	09/08/88								0.002 <
GWOF-4	07/28/88						479		0.002 <
GWOF-4	06/29/88	42.4	0	24.9	0.018	0.01 <	476	0.08	0.005
GWOF-4	06/09/88						465		0.004
GWOF-4	06/09/88						469		0.002 <
GWOF-4	04/26/88						421		0.035

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
GWOP-4	03/02/88						433		0.013
GWOP-5	03/23/88						700		0.014
PANCANA	03/02/88	59.9	0	63	0.01 <	0.05	722	0.032	0.002 <
PANCANA	07/22/86	81.4	5 <	95				0.04	
PPO #3	11/30/88	68	5 <	22		0.005 <	570	0.03	0.005 <
PPW #1	01/04/89	73	5 <	34		0.005 <	790	0.81	0.005 <
PPW #2	05/23/89	78	5 <	35		0.005 <	670	0.005 <	0.005 <
PPW #3	11/30/88	68	5 <	22		0.005 <	570	0.03	0.005 <
PPW #5	09/11/89	69	5 <	36		0.005 <	750	0.005 <	0.005 <
PPW #6	10/09/89	97	5 <	13		0.005 <	1000	0.005 <	0.005 <
PPW-6A	07/20/89	61	5 <	15		0.005 <	770	0.005 <	0.005 <
PUPW-2	03/24/88	51.7	0	26.3	0.01 <	0.013	571	0.01	0.0032
PUPW-2	03/16/88	49.2	0	44	0.01 <	0.01 <	660	0.01 <	0.0058
PUPW-2	03/09/88	50.1	0	43.1	0.01 <	0.025	658	0.01 <	0.0047
PUPW-2	03/02/88	46.8	0	44.3	0.01 <	0.24	644	0.01 <	0.002 <
PUPW-2	02/25/88	84.6	0	14.1	0.01 <	0.01 <	921	0.05	0.002 <
PUPW-2	02/18/88	64.5	0	92	0.01 <	0.01 <	688	0.01 <	0.002 <
PUPW-2	02/11/88	33.4	0	80	0.01 <	0.01 <	660	0.01 <	0.002 <
P-181	03/24/88	82.5	0	43.4	0.01 <	0.01 <	706	0.01 <	0.0087
P-181	03/16/88	49.8	0	26.8	0.01 <	0.01 <	500	0.01 <	0.0062
P-181	03/09/88	41.8	0	27.6	0.01 <	0.1	467	0.068	0.002 <
P-181	03/02/88	29.6	0	28	0.01 <	0.04	464	0.013	0.002 <
P-181	09/11/87	38.2	0	30	0.01 <	0.01 <	454	0.01 <	0.002 <
P-181	09/10/87	38.5	0	30.5	0.01 <	0.01 <	441	0.01 <	0.002 <
P-181	09/08/87	24.5	0	32.7	0.01 <	0.01 <	452	0.01 <	0.004
P-181	09/04/87	26.6	0	32.4	0.01 <	0.01 <	483	0.01 <	0.002 <
RC-4	12/21/88						590		0.005 <
W BAZZA PIT	07/14/89	89	5 <	16		0.005 <	910	0.005 <	0.005 <
W BAZZA PIT	04/26/89	94	5 <	15		0.005 <	890	0.005 <	0.005 <
W BAZZA PIT	01/05/89	84	5 <	18		0.005 <	1100	0.005 <	0.005 <
W BAZZA PIT	11/10/88	81	5 <	17		0.005 <	970	0.005 <	0.005 <
W BAZZA PIT	04/16/87	50.8	0	20	0.01 <	0.01 <	904	0.01 <	0.002 <
W #9 PIT	07/14/89	46	5 <	16		0.005 <	730	0.005 <	0.005 <
W #9 PIT	04/06/89	70	5 <	16		0.005 <	820	0.005 <	0.015
W #9 PIT	01/05/89	79	5 <	22		0.005 <	1000	0.005 <	0.005 <
W #9 PIT	11/10/88	79	5 <	15		0.005 <	980	0.005 <	0.005 <
W #9 PIT	09/27/88	93.3	0	17.8	0.01 <	0.01 <	813	0.013	0.013
W #9 PIT	06/28/88	32.1	0	11.9	0.01 <	0.01 <	764	0.01 <	0.008
W #9 PIT	04/25/88	30.2	4.5	18.6	0.01 <	0.01 <	703	0.025	0.024
W #9 PIT	02/18/88	28.7	7.8	29.8	0.01 <	0.01 <	537	0.01 <	0.0091
W #9 PIT	06/30/87	33	7.3	20.2	0.01 <	0.01 <	697	0.01 <	0.058
W #9 PIT	04/16/87	38	0	22	0.01 <	0.01 <	740	0.01 <	0.024
WW1	11/10/88	60	5 <	67		0.005 <	920	0.005 <	0.086
WW1	09/27/88	42.1	0	67.1	0.01 <	0.01 <	766	0.02	0.049
WW1	06/30/88	62.9	0	44.6	0.01 <	0.01 <	731	0.01 <	0.032
WW1	04/26/88						733		0.009
WW1	10/26/87						745		0.057

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
WW1	06/30/87	65	0	60.1	0.01 <	0.01 <	737	0.01 <	0.002 <
WW1	06/11/87								0.032
WW1	04/16/87	62	0	60	0.01 <	0.01 <	743	0.01 <	0.016

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)	Hydroxide
AA WELL	07/14/89	0.1 <	0.005 <	0.5	<0.00 <	150			5 <
AA WELL	04/06/89	0.1 <	0.005 <	0.5	<0.00 <	150			5 <
AA WELL	01/12/89	0.1 <	0.005 <	0.5	0.00 <	140			5 <
AA WELL	11/21/88	0.1 <	0.005 <	1.1	0.00	260			5 <
AA WELL	09/27/88	0.002 <		0.46	0.01 <	84	0	75	0
AA WELL	06/29/88	0.002 <		0.46	0.01 <	156	0	160	0
AA WELL	04/26/88	0.002 <		0.1	<0.01 <	101	0	105	0
AA WELL	01/28/88	0.002 <		0.46	0.01 <	166	0	138	0
AA WELL	12/29/87								
AA WELL	12/29/87								
AA WELL	10/28/87								
AA WELL	10/28/87								
AA WELL	09/17/87	0.002 <		0.65	0.01 <	156	0	127	0
AA WELL	08/06/87	0.002 <		0.456	0.01 <	156	0	91	0
AA WELL	06/30/87	0.002 <		0.45	0.01 <	160	0	154	0
AA WELL	06/15/87	0.002 <		0.36	0.01 <	159	0	190	0
AA WELL	09/24/87	0.002 <		0.76		184			0
BAZZA WELL	11/10/88	0.1 <	0.005 <	1.7	0.05 <	360			5 <
BAZZA WELL	09/27/88	0.002 <		1.57	0.01 <	352	0	390	0
BAZZA WELL	06/29/88	0.002 <		1.54	0.01 <	336	0	334	0
BAZZA WELL	04/25/88	0.002 <		0.71	0.01 <	302	0	321	0
BAZZA WELL	02/25/88	0.002 <		0.41	0.01 <	280	79	269	0
BAZZA WELL	06/30/87	0.002 <		1.2	0.01 <	331	0	382	0
BAZZA PIT	09/27/88	0.002 <		1.66	0.01 <	358	0	350	0
BAZZA PIT	06/28/88	0.002 <		1.56	0.01 <	245	0	283	0
BAZZA PIT	04/25/88	0.002 <		0.69	0.01 <	290	0	320	0
BAZZA PIT	06/30/87	0.002 <		1.96	0.01 <	379	167	387	0
BAZZA PIT	04/16/87	0.002 <		1.9	0.01 <	258	0	279	0
BAZZA WELL	07/14/89	0.1 <	0.005 <	2.3	0.00 <	360			5 <
BAZZA WELL	04/06/89	0.1 <	0.005 <	1.4	0.00 <	350			5 <
BAZZA WELL	01/12/89		0.005 <	1.7	0.00 <	340			5 <
BAZZA WELL	01/12/89	0.1 <	0.005 <	1.7	0.00 <	340			5 <
BAZZA WELL	11/10/88	0.1 <	0.005 <	1.7	0.00 <	360			5 <
BW-1	11/30/88	0.1 <	0.005 <	1.7	0.00 <	330			5 <
BW-1	11/21/88	0.1 <	0.005 <	1.5	0.00 <	350			5 <
BW-1	11/10/88	0.1 <	0.005 <	1.6	0.00 <	350			5 <
BW-1	11/02/88	0.1 <	0.005 <	1.4	0.00 <	310			5 <
BW-1	10/05/88	0.1 <	0.005 <	1.5	0.00 <	340			5 <
BWD-1	06/25/87	0.002 <		1.07	0.01 <	334	0	316	0
GWOF-6	03/10/89	0.1 <	0.79						
GWOF-6	03/06/89	4.7	2.3						
GWOF-6	02/24/89	0.1 <	0.023	1.3	0.01	160			5 <
GWOF 6	06/29/88	0.002 <		0.95	0.01 <	305	68	257	0
GWOF 6	06/09/88	0.002 <							
GWOF 6	06/09/88	0.002 <			0.01 <				
GWOF 6	04/26/88	0.002 <			0.01 <				
GWOF 6	03/02/88	0.002 <			0.01 <				

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)	Hydroxide
GWOP 6	01/28/88	0.002 <		1.31	0.01 <	95	0	82	0
GWOP-10	09/29/89	0.1 <	0.005 <		0.00 <				
GWOP-10	08/17/89	0.1 <	0.005 <		0.00 <				
GWOP-10	07/19/89	0.1 <	0.005 <	1	0.00 <	160			5 <
GWOP-10	06/29/89	0.1 <	0.005 <	1	0.00 <	170			5 <
GWOP-10	05/17/89	0.1 <	0.005 <		0.00 <				
GWOP-10	04/12/89	0.1 <	0.005 <	1.1	0.00 <	150			5 <
GWOP-10	03/22/89	0.1 <	0.005 <		0.00 <				
GWOP-10	02/28/89	0.1 <	0.005 <		0.00 <				
GWOP-10	01/27/89	0.1 <	0.005 <	1.1	0.00 <	170			5 <
GWOP-10	12/21/88	0.1 <	0.005 <		0.00 <				
GWOP-10	11/22/88	0.1 <	0.005 <	2	0.00 <	140			5 <
GWOP-11	09/29/89	0.1 <	0.005 <		0.00 <				
GWOP-11	08/17/89	0.1 <	0.005 <		0.00 <				
GWOP-11	07/25/89	0.1 <	0.005 <	1.1	0.00 <	140			5 <
GWOP-11	06/29/89	0.1 <	0.005 <	0.8	0.00 <	190			5 <
GWOP-11	05/17/89	0.1 <	0.005 <		0.00 <				
GWOP-11	04/12/89	0.1 <	0.005 <	1	0.00 <	170			5 <
GWOP-11	03/22/89	0.1 <	0.005 <		0.00 <				
GWOP-11	02/28/89	0.1 <	0.005		0.00 <				
GWOP-11	02/28/89	0.1 <	0.005		0.00 <				
GWOP-11	01/27/89	0.1 <	0.005 <	1.5	0.00 <	82			5 <
GWOP-11	12/21/88	0.1 <	0.005 <		0.00 <				
GWOP-11	11/22/88	0.1 <	0.005 <	1.5	0.00	89			5 <
GWOP-2	08/31/89	0.1 <	0.005 <		0.02				
GWOP-2	07/14/89	0.1 <	0.008	0.6	0.00 <	290			5 <
GWOP-2	06/30/89	0.1 <	0.015		0.01				
GWOP-2	05/23/89	0.1 <	0.005 <		0.01				
GWOP-2	04/28/89	0.1 <	0.005 <	0.8	0.02	310			5 <
GWOP-2	03/24/89	0.1 <	0.005 <		0.01				
GWOP-2	02/28/89	0.05 <	0.005 <		0.02				
GWOP-2	09/08/88	0.002 <							
GWOP-4	08/31/89	0.1 <	0.005 <		0.00 <				
GWOP-4	07/14/89	0.1 <	0.005 <	0.6	0.00 <	210			5 <
GWOP-4	06/30/89	0.1 <	0.005 <		0.00 <				
GWOP-4	05/23/89	0.05 <	0.005 <	0.6	0.00 <	260			5 <
GWOP-4	02/28/89	0.1 <	0.005 <	0.7	0.00 <	200			5 <
GWOP-4	12/21/88	0.1 <	0.005 <		0.00 <				
GWOP-4	11/21/88	0.1 <	0.005 <	0.6	0.00 <	230			5 <
GWOP-4	10/21/88	0.1 <	0.005 <		0.00 <				
GWOP-4	09/28/88	0.002 <		0.6	0.01 <	180	0	142	0
GWOP-4	09/08/88	0.002 <			0.03				
GWOP-4	07/28/88	0.002 <			0.01 <				
GWOP-4	06/29/88	0.002 <		0.62	0.01 <	176	0	161	0
GWOP-4	06/09/88	0.002 <			0.01 <				
GWOP-4	06/09/88	0.002 <			0.01 <				
GWOP-4	04/26/88	0.03			0.01 <				

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)	Hydroxide
GWOP-4	03/02/88	0.002 <			0.01 <				
GWOP-5	03/23/88	0.002 <			0.03				
PANCANA	03/02/88	0.002 <		0.46	0.01 <	309	129	323	0
PANCANA	07/22/86			0.4					
PPO #3	11/30/88	0.1 <	0.005 <	1.3	0.00 <	250			5 <
PPW #1	01/04/89	0.1 <	0.005 <	0.6	0.05	260			5 <
PPW #2	05/23/89	0.1 <	0.005 <	0.6	0.00 <	300			5 <
PPW #3	11/30/88	0.1 <	0.005 <	1.3	0.00 <	250			5 <
PPW #5	09/11/89	0.1 <	0.005 <	0.5	<0.00 <	310			5 <
PPW #6	10/09/89	0.1 <	0.005 <	1.3	0.00 <	340			5 <
PPW-6A	07/20/89	0.1 <	0.005 <	1.4	0.00 <	260			5 <
PUPW-2	03/24/88	0.002 <		0.486	0.01 <	285	0	272	0
PUPW-2	03/16/88	0.002 <		0.439	0.01 <	288	76	272	0
PUPW-2	03/09/88	0.002 <		0.61	0.01 <	285	74	274	0
PUPW-2	03/02/88	0.002 <		0.38	0.01 <	288	82	278	0
PUPW-2	02/25/88	0.002 <		1.35	0.01 <	288	293	0	0
PUPW-2	02/18/88	0.002 <		0.34	0.01 <	286	88	270	0
PUPW-2	02/11/88	0.002 <		1.5	0.01 <	203	85	206	0
P-181	03/24/88	0.002 <		0.42	0.02	293	75	302	0
P-181	03/16/88	0.002 <		0.522	0.01 <	229	0	217	0
P-181	03/09/88	0.002 <		0.42	0.01 <	209	12	200	0
P-181	03/02/88	0.002 <		0.89	0.01 <	202	18	170	0
P-181	09/11/87	0.002 <		0.61	0.01 <	187	27	160	0
P-181	09/10/87	0.002 <		0.6	0.01 <	192	24	172	0
P-181	09/08/87	0.002 <		0.55	0.01 <	192	28	132	0
P-181	09/04/87	0.002 <		0.96	0.01 <	198	26	135	0
RC-4	12/21/88	0.1 <	0.005 <		0.00 <				
W BAZZA PIT	07/14/89	0.1 <	0.005 <	1.6	0.00 <	340			5 <
W BAZZA PIT	04/26/89	0.1 <	0.005 <	1.4	0.00 <	330			5 <
W BAZZA PIT	01/05/89	0.1 <	0.005 <	1.6	0.00 <	300			5 <
W BAZZA PIT	11/10/88	0.1 <	0.005 <	1.6	0.00 <	330			5 <
W BAZZA PIT	04/16/87	0.002 <		1.35	0.01 <	286	0	277	0
W #9 PIT	07/14/89	0.1 <	0.005 <	1.4	0.00 <	230			5 <
W #9 PIT	04/06/89	0.1 <	0.005 <	1.3	0.00 <	260			5 <
W #9 PIT	01/05/89	0.1 <	0.005 <	1.4	0.00 <	300			5 <
W #9 PIT	11/10/88	0.1 <	0.005 <	1.6	0.00 <	370			5 <
W #9 PIT	09/27/88	0.002 <		1.6	0.01 <	334	0	343	0
W #9 PIT	06/28/88	0.002 <		1.44	0.01 <	139	0	158	0
W #9 PIT	04/25/88	0.002 <		0.55	0.01 <	215	0	197	0
W #9 PIT	02/18/88	0.002 <		0.69	0.01 <	142	0	129	0
W #9 PIT	06/30/87	0.002 <		1.16	0.01 <	182	0	209	0
W #9 PIT	04/16/87	0.002 <		1.35	0.01 <	213	0	237	0
WW1	11/10/88	0.1 <	0.007	0.5	<0.00 <	340			5 <
WW1	09/27/88	0.008		0.49	0.01 <	318	151	261	0
WW1	06/30/88	0.002 <		0.5	0.01 <	298	109	320	0
WW1	04/26/88	0.002 <			0.04				
WW1	10/26/87				0.01 <				

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)	Hydroxide
WW1	06/30/87	0.002 <		0.05	0.01 <	307	150	309	0
WW1	06/11/87	0.002 <							
WW1	04/16/87	0.002 <		0.43	0.01 <	213	127	329	0

Well ID	Sampling Date	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury	Nickel (T)	Nitrate	Nitrite
AA WELL	07/14/89		0.04	0.005 <	14	0.04	0.0001 <	0.01 <	0.39	
AA WELL	04/06/89		0.28	0.005 <	13	0.046	0.0001 <	0.01	0.42	
AA WELL	01/12/89		0.39	0.005 <	14	0.025	0.0001 <	0.01 <	0.8	
AA WELL	11/21/88		1.5	0.005 <	21	0.12	0.0001 <	0.01	0.28	
AA WELL	09/27/88	0.01	0.17	0.01 <	13.6	0.04	0.0002 <	0.01 <	0.12	0.005 <
AA WELL	06/29/88	0.065	1.14	0.01 <	18.2	0.023	0.0002 <	0.025	0.68	0.005 <
AA WELL	04/26/88	0.122	0.135	0.01 <	16	0.01 <	0.0002 <	0.01 <	1.26	0.013
AA WELL	01/28/88	0.01 <	0.105	0.01 <	14.2	0.12	0.0002 <	0.01 <	0.27	0.034
AA WELL	12/29/87									
AA WELL	12/29/87									
AA WELL	10/28/87									
AA WELL	10/28/87									
AA WELL	09/17/87	0.01 <	0.24	0.01 <	16.3	0.045	0.0002 <	0.01 <	0.88	0.012
AA WELL	08/06/87	0.01 <	0.38	0.038	15.6	0.042	0.0002 <	0.01	0.28	0.005 <
AA WELL	06/30/87	0.08	0.74	0.01 <	16.8	0.053	0.0002 <	0.01 <	0.7	0.023
AA WELL	06/15/87	0.36	3.12	0.02	9	0.098	0.0002 <	0.01 <	0.069	0.031
AA WELL	09/24/87	0.01 <	0.3	0.02	28.8	0.055	0.0002 <	0.01 <	0.072	0.018
BAZZA WELL	11/10/88		0.64	0.005 <	21	0.056	0.0001 <	0.01 <	0.05 <	
BAZZA WELL	09/27/88	0.48	0.69	0.01 <	26.1	0.055	0.0002 <	0.01 <	0.01 <	0.005 <
BAZZA WELL	06/29/88	0.258	0.995	0.01 <	29.3	0.055	0.0002 <	0.01 <	0.032	0.005 <
BAZZA WELL	04/25/88	0.044	9.72	0.01 <	28.7	0.103	0.0002 <	0.03	0.01 <	0.011
BAZZA WELL	02/25/88	0.01 <	0.855	0.06	25.6	0.04	0.0002 <	0.028	0.14	0.0092
BAZZA WELL	06/30/87	0.18	1.07	0.12	24.8	0.056	0.0002 <	0.01 <	0.047	0.007
BAZZA PIT	09/27/88	0.72	0.955	0.01 <	26.4	0.04	0.0002 <	0.01 <	0.57	0.005 <
BAZZA PIT	06/28/88	0.045	0.065	0.01 <	29.9	0.01	<0.00042	0.023	0.89	0.007
BAZZA PIT	04/25/88	0.01 <	0.195	0.01 <	30.7	0.028	0.0002 <	0.01 <	1.34	0.017
BAZZA PIT	06/30/87	0.01 <	0.15	0.01 <	30.9	0.245	0.0002 <	0.022	0.2	0.018
BAZZA PIT	04/16/87	0.033	0.168	0.02	35.7	0.045	0.0002 <	0.068	1.67	0.068
BAZZA WELL	07/14/89		0.72	0.005 <	23	0.056	0.0001 <	0.01 <	0.05 <	
BAZZA WELL	04/06/89			0.005 <	22	0.061	0.0001 <	0.01 <	0.05 <	
BAZZA WELL	01/12/89		0.68	0.005 <	24	0.063	0.0001 <	0.01 <	0.08	
BAZZA WELL	01/12/89		0.68	0.005 <	24	0.063	0.0001 <	0.01 <	0.08	
BAZZA WELL	11/10/88		0.64	0.005 <	21	0.056	0.0001 <	0.01 <	0.05 <	
BW-1	11/30/88		0.83	0.005 <	22	0.024	0.0001 <	0.01 <	0.05 <	
BW-1	11/21/88		4.3	0.005 <	22	0.082	0.0001 <	0.01 <	0.05 <	
BW-1	11/10/88		0.82	0.005 <	21	0.02	0.0001 <	0.01 <	0.05 <	
BW-1	11/02/88		1.3	0.005 <	22	0.028	0.0001 <	0.01 <	0.05 <	
BW-1	10/05/88		0.66	0.005 <	24	0.02	0.0001 <	0.01 <	0.05 <	
BWD-1	06/25/87	0.26	1.96	0.01 <	48.5	0.17	0.00028	0.01 <	0.06	0.011
GWOF-6	03/10/89									
GWOF-6	03/06/89									
GWOF-6	02/24/89		8	0.018	13	0.17	0.0009	0.01 <	1.3	
GWOF 6	06/29/88	0.15	2.06	0.02	32.6	0.823	0.0002 <	0.023	9.17	0.147
GWOF 6	06/09/88									
GWOF 6	06/09/88									
GWOF 6	04/26/88									
GWOF 6	03/02/88									

Well ID	Sampling Date	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury	Nickel (T)	Nitrate	Nitrite
GWOF 6	01/28/88	0.26	9.98	0.13	7.5	2.31	0.00034	0.12	1.28	1.01
GWOF-10	09/29/89									
GWOF-10	08/17/89									
GWOF-10	07/19/89		0.02	0.006	12	0.005 <	0.0001 <	0.01 <	2.5	
GWOF-10	06/29/89		0.05	0.005 <	12	0.007	0.0001 <	0.01 <	1.3	
GWOF-10	05/17/89									
GWOF-10	04/12/89		0.12	0.005 <	11	0.007	0.0001 <	0.01 <	1.3	
GWOF-10	03/22/89									
GWOF-10	02/28/89									
GWOF-10	01/27/89		4.2	0.008	11	0.11	0.0001 <	0.01 <	1.3	
GWOF-10	12/21/88									
GWOF-10	11/22/88		34	0.082	12	0.78	0.0001 <	0.02	0.05 <	
GWOF-11	09/29/89									
GWOF-11	08/17/89									
GWOF-11	07/25/89		0.03	0.006	10	0.011	0.0001 <	0.01 <	0.56	
GWOF-11	06/29/89		0.05	0.005 <	16	0.013	0.0001 <	0.01 <	0.8	
GWOF-11	05/17/89									
GWOF-11	04/12/89		0.1	0.005 <	15	0.015	0.0001 <	0.01 <	1.2	
GWOF-11	03/22/89									
GWOF-11	02/28/89									
GWOF-11	02/28/89									
GWOF-11	01/27/89		8.9	0.032	6.3	0.24	0.0002	0.01 <	0.05 <	
GWOF-11	12/21/88									
GWOF-11	11/22/88		8.1	0.011	4.8	0.18	0.0001 <	0.01	0.39	
GWOF-2	08/31/89									
GWOF-2	07/14/89		3.6	0.005 <	17	0.081	0.0003	0.02	8.6	
GWOF-2	06/30/89									
GWOF-2	05/23/89									
GWOF-2	04/28/89		0.89	0.005 <	20	0.029	0.0002	0.02	7.6	
GWOF-2	03/24/89									
GWOF-2	02/28/89									
GWOF-2	09/08/88									
GWOF-4	08/31/89									
GWOF-4	07/14/89		2.6	0.012	13	0.73	0.0003	0.02	0.05 <	
GWOF-4	06/30/89									
GWOF-4	05/23/89		26	0.086	20	1.2	0.0015	0.04	0.05	
GWOF-4	02/28/89		1.8	0.012	14	0.047	0.0002 <	0.01 <	2.7	
GWOF-4	12/21/88									
GWOF-4	11/21/88		24	0.075	17	0.41	0.0002	0.02	0.15	
GWOF-4	10/21/88									
GWOF-4	09/28/88	0.29	12.22	0.01 <	14.3	0.573	0.0002 <	0.025	1.22	0.005 <
GWOF-4	09/08/88									
GWOF-4	07/28/88									
GWOF-4	06/29/88	0.058	5.08	0.05	13.3	0.54	0.0002 <	0.01 <	0.052	0.006
GWOF-4	06/09/88									
GWOF-4	06/09/88									
GWOF-4	04/26/88									

Well ID	Sampling Date	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury	Nickel (T)	Nitrate	Nitrite
GWOF-4	03/02/88									
GWOF-5	03/23/88									
FANCANA	03/02/88	0.01 <	1.18	0.01 <	42.2	0.01 <	0.0002 <	0.025	0.18	0.005 <
FANCANA	07/22/86		0.19	0.013	30.3	0.03	0.0001 <	0.01 <	7.1	
PFO #3	11/30/88		3.3	0.034	20	0.088	0.0001 <	0.02	0.05 <	
PFW #1	01/04/89		1.1	0.048	20	0.036	0.0007	0.02	0.95	
PFW #2	05/23/89		0.13	0.01 <	23	0.049	0.0017	0.01	0.51	
PFW #3	11/30/88		3.3	0.034	20	0.088	0.0001 <	0.02	0.05 <	
PFW #5	09/11/89		0.33	0.005 <	26	0.025	0.0002	0.02	0.3	
PFW #6	10/09/89		0.26	0.005 <	23	0.03	0.0001	0.01	0.05 <	
PFW-6A	07/20/89		0.01 <	0.005 <	21	0.022	0.0001 <	0.01 <	0.1	
PUPW-2	03/24/88	0.01 <	0.805	0.01 <	34.6	0.033	0.0002 <	0.015	0.22	0.018
PUPW-2	03/16/88	0.01 <	1.64	0.01 <	36.3	0.04	0.0002 <	0.03	0.12	0.014
PUPW-2	03/09/88	0.01 <	1.73	0.01 <	36.2	0.04	0.0002 <	0.033	0.12	0.0062
PUPW-2	03/02/88	0.01 <	2.09	0.023	39.1	0.043	0.0002 <	0.025	0.092	0.005 <
PUPW-2	02/25/88	0.031	3.03	0.057	19.9	0.048	0.00023	0.035	0.68	0.005 <
PUPW-2	02/18/88	0.012	0.925	0.055	26.4	0.043	0.00029	0.02	0.022	0.029
PUPW-2	02/11/88	0.029	1.14	0.035	29.8	0.05	0.00021	0.021	0.048	0.033
P-181	03/24/88	0.01 <	0.098	0.01 <	23.4	<	0.0002 <	0.01 <	0.072	0.017
P-181	03/16/88	0.01 <	0.78	0.01 <	22.4	0.01 <	0.0002 <	0.015	0.037	0.032
P-181	03/09/88	0.01 <	1.03	0.245	23.2	0.013	0.0002 <	0.06	0.087	0.005 <
P-181	03/02/88	0.01 <	0.81	0.01 <	23.4	0.01 <	0.0002 <	0.025	0.13	0.005 <
P-181	09/11/87	0.092	0.56	0.01 <	17.3	0.01 <	0.0002 <	0.01 <	0.89	0.025
P-181	09/10/87	0.08	0.33	0.01 <	17.1	0.01 <	0.0002 <	0.01 <	0.92	0.024
P-181	09/08/87	0.13	0.618	0.01 <	17.1	0.01 <	0.0002 <	0.01 <	0.78	0.018
P-181	09/04/87	0.018	0.348	0.01 <	16.7	0.018	0.0002 <	0.01 <	0.69	0.011
RW-4	12/21/88									
W BAZZA PIT	07/14/89		0.04	0.005 <	24	0.016	0.0001 <	0.01 <	0.43	
W BAZZA PIT	04/26/89		0.09	0.005 <	23	0.045	0.0001 <	0.01 <	0.54	
W BAZZA PIT	01/05/89		0.18	0.005 <	22	0.071	0.0001 <	0.01	0.74	
W BAZZA PIT	11/10/88		0.11	0.005 <	22	0.009	0.0001 <	0.01 <	0.69	
W BAZZA PIT	04/16/87	0.01 <	0.075	0.015	36.2	0.015	0.0002 <	0.02	0.7	0.039
W #9 PIT	07/14/89		0.24	0.005 <	24	0.022	0.0001 <	0.01 <	0.4	
W #9 PIT	04/06/89		0.07	0.005 <	23	0.019	0.0006	0.01 <	0.89	
W #9 PIT	01/05/89		0.5	0.005 <	24	0.047	0.0001 <	0.01 <	0.5	
W #9 PIT	11/10/88		0.34	0.005 <	22	0.021	0.0001 <	0.01 <	0.16	
W #9 PIT	09/27/88	0.36	0.835	0.01 <	26.6	0.04	0.0002 <	0.01 <	0.64	0.005 <
W #9 PIT	06/29/88	0.05	0.43	0.01 <	18.9	0.013	0.0002 <	0.023	0.38	0.037
W #9 PIT	04/25/88	0.01 <	0.055	0.01 <	29.5	0.01	<0.00028	0.01 <	1.54	0.029
W #9 PIT	02/18/88	0.01 <	0.255	0.07	13.9	0.01 <	0.0002 <	0.01 <	0.88	0.04
W #9 PIT	06/30/87	0.01 <	0.59	0.073	30.8	0.015	0.0002 <	0.01 <	1.32	0.155
W #9 PIT	04/16/87	0.01 <	0.265	0.052	34.3	0.015	0.0002 <	0.01 <	0.55	0.112
WW1	11/10/88		0.01 <	0.005 <	31	0.005 <	0.0001 <	0.01 <	1.7	
WW1	09/27/88	0.08	1.77	0.01 <	37.8	0.038	0.0002 <	0.13	0.62	0.005 <
WW1	06/30/88	0.022	0.48	0.01 <	39.6	0.022	0.0002 <	0.01 <	0.88	0.208
WW1	04/26/88									
WW1	10/26/87									

Well ID	Sampling Date	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury	Nickel (T)	Nitrate	Nitrite
WW1	06/30/87	0.01 <	0.16	0.03	35.6	0.01 <	0.0002 <	0.01 <	1	0.005 <
WW1	06/11/87									
WW1	04/16/87	0.8	1.725	0.01 <	41.7	0.01 <	0.0002 <	0.01 <	0.89	0.007

Well ID	Sampling Date	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T-ICP)	Silver (T)	Sodium	Sulfate
AA WELL	07/14/89	0.04	5.8	0.005 <		23	0.005 <	27	56
AA WELL	04/06/89	0.06	5.4	0.005 <		24	0.005 <	26	65
AA WELL	01/12/89	0.04	5.7	0.005 <		49	0.005 <	28	58
AA WELL	11/21/88	0.13	15	0.005 <		17	0.005 <	62	82
AA WELL	09/27/88	0.055	4.9	0.002 <	53.4		0.028	24.7	2.9
AA WELL	06/29/88	0.07	4.8	0.002 <	51.5		0.01 <	26.8	50.9
AA WELL	04/26/88	0.1	6.2	0.002 <	53		0.01 <	27.6	21.1
AA WELL	01/28/88	0.085	6.3	0.0022	48.1		0.01 <	25.4	56.7
AA WELL	12/29/87								
AA WELL	12/29/87								
AA WELL	10/28/87								
AA WELL	10/28/87								
AA WELL	09/17/87	0.064	5.8	0.002 <	44		0.01 <	25.4	66
AA WELL	08/06/87	0.111	4	0.002 <	46.8		0.01 <	25	6.8
AA WELL	06/30/87	0.28	6	0.002 <	48.5		0.01 <	25.2	45
AA WELL	06/15/87	0.36	7	0.002 <	37		0.01 <	22.8	78.2
AA WELL	09/24/87	0.01 <	5.6	0.002	14.9		0.022	30.3	55
BAZZA WELL	11/10/88	0.02 <	22	0.005 <		14	0.005 <	74	77
BAZZA WELL	09/27/88	0.01 <	24.8	0.002 <	40.1		0.01 <	77.6	200
BAZZA WELL	06/29/88	0.01 <	22	0.0027	35.4		0.01 <	76.4	70.4
BAZZA WELL	04/25/88	0.01 <	23.6	0.0029	32.4		0.01 <	76.8	212
BAZZA WELL	02/25/88	0.48	3.5	0.002 <	28.7		0.01 <	31.7	130
BAZZA WELL	06/30/87	0.01 <	7.2	0.002 <	31.2		0.01 <	56.2	53
BAZZA PIT	09/27/88	0.222	27.1	0.002 <	44.6		0.01 <	83.2	168
BAZZA PIT	06/28/88	0.01 <	23.1	0.0029	29.8		0.01 <	77.2	137
BAZZA PIT	04/25/88	0.01 <	24.8	0.002 <	29.3		0.01 <	75.6	196
BAZZA PIT	06/30/87	0.014	23	0.0023	13.1		0.01 <	35.6	393
BAZZA PIT	04/16/87	0.035	21	0.0038	29.9		0.01 <	77.4	175
BAZZA WELL	07/14/89	0.02 <	25	0.005 <		16	0.005 <	78	76
BAZZA WELL	04/06/89	0.02 <	24	0.005 <		18	0.005 <	81	74
BAZZA WELL	01/12/89	0.02 <	28	0.005 <		32	0.005 <	84	75
BAZZA WELL	01/12/89	0.02 <	24	0.005 <		32	0.005 <	84	75
BAZZA WELL	11/10/88	0.02 <	22	0.005 <		14	0.005 <	74	77
BW-1	11/30/88	0.03	24	0.005 <		19	0.005 <	76	86
BW-1	11/21/88	0.02 <	23	0.005 <		17	0.005 <	71	82
BW-1	11/10/88	0.02 <	21	0.005 <		17	0.005 <	73	92
BW-1	11/02/88	0.05	23	0.005 <		18	0.005 <	72	91
BW-1	10/05/88	0.4	24	0.005 <		20	0.005 <	85	90
BWD-1	06/25/87	0.01 <	19.2	0.002 <	28.3		0.01 <	79	50
GWOF-6	03/10/89								
GWOF-6	03/06/89								
GWOF-6	02/24/89	0.19	4.2	0.005 <		35	0.005 <	120	170
GWOF 6	06/29/88	0.1	3.9	0.002 <	52.9		0.01 <	95.4	125
GWOF 6	06/09/88								
GWOF 6	06/09/88								
GWOF 6	04/26/88								
GWOF 6	03/02/88								

Well ID	Sampling Date	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T-ICP)	Silver (T)	Sodium	Sulfate
GWOF 6	01/28/88	0.119	9.5	0.0041	39.4		0.01 <	47.2	38.8
GWOF-10	09/29/89								
GWOF-10	08/17/89								
GWOF-10	07/19/89	0.29	10	0.005 <		27	0.005 <	57	57
GWOF-10	06/29/89	0.3	10	0.005 <		24	0.005 <	51	63
GWOF-10	05/17/89								
GWOF-10	04/12/89	0.31	11	0.005 <		26	0.005 <	52	60
GWOF-10	03/22/89								
GWOF-10	02/28/89								
GWOF-10	01/27/89	0.31	15	0.005 <		30	0.005 <	61	60
GWOF-10	12/21/88								
GWOF-10	11/22/88	0.02	22	0.005		27	0.005 <	120	120
GWOF-11	09/29/89								
GWOF-11	08/17/89								
GWOF-11	07/25/89	0.06	12	0.005 <		22	0.005 <	59	80
GWOF-11	06/29/89	0.08	13	0.005 <		24	0.005 <	47	70
GWOF-11	05/17/89								
GWOF-11	04/12/89	0.07	13	0.005 <		25	0.005 <	44	69
GWOF-11	03/22/89								
GWOF-11	02/28/89								
GWOF-11	02/28/89								
GWOF-11	01/27/89	0.08	16	0.005 <		44	0.005 <	92	80
GWOF-11	12/21/88								
GWOF-11	11/22/88	0.32	18	0.005 <		32	0.005 <	120	69
GWOF-2	08/31/89								
GWOF-2	07/14/89	0.15	17	0.026		17	0.005 <	78	290
GWOF-2	06/30/89								
GWOF-2	05/23/89								
GWOF-2	04/28/89	0.35	5	0.034		12	0.005 <	93	380
GWOF-2	03/24/89								
GWOF-2	02/28/89								
GWOF-2	09/08/88								
GWOF-4	08/31/89								
GWOF-4	07/14/89	0.14	5.2	0.005 <		18	0.005 <	43	60
GWOF-4	06/30/89								
GWOF-4	05/23/89	0.02 <	12	0.005 <		33	0.005 <	48	60
GWOF-4	02/28/89	0.13	6.1	0.005 <		19	0.005 <	47	68
GWOF-4	12/21/88								
GWOF-4	11/21/88	0.11	12	0.005 <		31	0.005 <	40	33
GWOF-4	10/21/88								
GWOF-4	09/28/88	0.158	7.9	0.002 <	44.4		0.01 <	36.9	14
GWOF-4	09/08/88								
GWOF-4	07/28/88								
GWOF-4	06/29/88	0.16	4.1	0.002 <	39.8		0.01 <	38.1	34.4
GWOF-4	06/09/88								
GWOF-4	06/09/88								
GWOF-4	04/26/88								

Well ID	Sampling Date	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T-ICP)	Silver (T)	Sodium	Sulfate
GWOP-4	03/02/88								
GWOP-5	03/23/88								
PANCANA	03/02/88	0.018	7.8	0.002 <	20.2		0.01 <	35.1	146
PANCANA	07/22/86			0.002					150
PPW #3	11/30/88	0.02 <	15	0.005 <		14	0.005 <	60	83
PPW #1	01/04/89	0.08	7	0.005 <		14	0.005 <	39	110
PPW #2	05/23/89	0.06	7.9	0.007		15	0.005 <	40	120
PPW #3	11/30/88	0.02 <	15	0.005 <		14	0.005 <	60	83
PPW #5	09/11/89	0.24	5.5	0.008		13	0.005 <	38	130
PPW #6	10/09/89	0.08	21	0.005 <		18	0.005 <	84	96
PPW-6A	07/20/89	0.04	20	0.005 <		14	0.005 <	64	68
PUPW-2	03/24/88	0.025	5	0.002 <	30.1		0.01 <	32.8	71
PUPW-2	03/16/88	0.655	4.1	0.002 <	23.4		0.01 <	33.4	110
PUPW-2	03/09/88	0.26	4.8	0.002 <	24.8		0.088	32.8	130
PUPW-2	03/02/88	0.38	5.4	0.002 <	24.3		0.01 <	33.4	121
PUPW-2	02/25/88	0.01 <	19.7	0.002 <	18.7		0.013	76.8	58
PUPW-2	02/18/88	0.667	3.6	0.0031	23.1		0.028	32.4	56
PUPW-2	02/11/88	1.34	4.6	0.002 <	24		0.01 <	40.2	44
P-181	03/24/88	0.393	2.7	0.002 <	23.8		0.01	29.7	118
P-181	03/16/88	0.029	2.9	0.002 <	30.2		0.08	29.1	72
P-181	03/09/88	0.055	2.9	0.0021	30.6		0.06	28.8	75.3
P-181	03/02/88	0.061	2.8	0.002 <	29.4		0.01 <	28.3	63.2
P-181	09/11/87	0.188	2.6	0.002 <	30.2		0.01 <	25.8	51
P-181	09/10/87	0.181	2.7	0.002 <	32.1		0.01 <	26.3	49
P-181	09/08/87	0.43	2.4	0.002 <	30.5		0.01 <	25.8	19
P-181	09/04/87	0.58	2.5	0.002 <	30.5		0.01 <	29.8	18
RC-4	12/21/88								
W BAZZA PIT	07/14/89	0.02 <	24	0.005 <		15	0.005 <	75	110
W BAZZA PIT	04/26/89	0.02 <	23	0.005 <		13	0.005 <	77	96
W BAZZA PIT	01/05/89	0.02 <	20	0.005 <		13	0.005 <	73	100
W BAZZA PIT	11/10/88	0.02 <	22	0.005 <		12	0.005 <	72	87
W BAZZA PIT	04/16/87	0.01 <	31.2	0.0034	24.8		0.01 <	82.2	82.8
W #9 PIT	07/14/89	0.02 <	27	0.005 <		15	0.005 <	87	96
W #9 PIT	04/06/89	0.02 <	23	0.005 <		15	0.005 <	80	97
W #9 PIT	01/05/89	0.06	19	0.005 <		16	0.005 <	68	110
W #9 PIT	11/10/88	0.08	22	0.005 <		16	0.005 <	75	86
W #9 PIT	09/27/88	0.01 <	29.5	0.002 <	17.7		0.01 <	79.6	165
W #9 PIT	06/28/88	0.02	26.8	0.0028	30.5		0.01 <	83.1	59
W #9 PIT	04/25/88	0.01 <	20.7	0.002 <	21.8		0.01 <	81.3	77
W #9 PIT	02/19/88	0.067	10.3	0.0021	21.9		0.093	57.2	12.8
W #9 PIT	06/30/87	0.012	27.4	0.002 <	29.3		0.01 <	72.8	53
W #9 PIT	04/16/87	0.017	24.6	0.0024	27.3		0.01 <	80.4	63.8
WW1	11/10/88	0.02 <	6.9	0.009		8.3	0.005 <	38	180
WW1	09/27/88	0.01 <	7.3	0.002 <	49.9		0.01 <	35.5	108
WW1	06/30/88	0.021	5.6	0.002 <	17		0.01 <	37.2	150
WW1	04/26/88								
WW1	10/26/87								

Well ID	Sampling Date	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T-ICP)	Silver (T)	Sodium	Sulfate
WW1	06/30/87	0.038	9.2	0.002 <	18.9		0.01 <	33.4	155
WW1	06/11/87								
WW1	04/16/87	0.03	8.7	0.003	16.7		0.01 <	35.8	167

Well ID	Sampling Date	Settleable Solids	Suspended Solids	Thallium	Total Dissolved Solids	Turbidity	Zinc (T)	pH Units
AA WELL	07/14/89	0.1 <	5 <	0.005 <	280	1.5	0.05	7.2
AA WELL	04/06/89	0.1 <	5 <	0.005 <	280	0.8	0.06	7.2
AA WELL	01/12/89	0.2	24	0.005 <	240	15	0.032	7.6
AA WELL	11/21/88	0.1 <	26	0.005 <	460	5	0.04	7.8
AA WELL	09/27/88		4.4	0.01 <	314	0.31	0.315	7.1
AA WELL	06/29/88		2.6	0.01 <	240	4.7	0.028	7.6
AA WELL	04/26/88		1 <	0.01 <	228	0.6	0.12	7.61
AA WELL	01/28/88		1.2	0.01 <	283	0.37	0.26	7.39
AA WELL	12/29/87							
AA WELL	12/29/87							
AA WELL	10/28/87							
AA WELL	10/28/87							
AA WELL	09/17/87		1 <	0.01 <	328	0.69	0.09	7.43
AA WELL	08/06/87		8	0.01 <	325	2.2	0.16	7.21
AA WELL	06/30/87		16	0.01 <	320	4.1	0.05	7.77
AA WELL	06/15/87		32	0.01 <	320	8.2	0.053	7.26
AA WELL	09/24/87		48		490	14	0.03	8.06
BAZZA WELL	11/10/88	0.1 <	6	0.01 <	590	8	0.029	7.6
BAZZA WELL	09/27/88		2.4	0.01 <	698	2.2	0.093	6.85
BAZZA WELL	06/29/88		4.2	0.01 <	605	6.7	0.01 <	6.84
BAZZA WELL	04/25/88		76	0.01 <	609	95	0.485	7.76
BAZZA WELL	02/25/88		1 <	0.01 <	475	5.5	0.038	7.41
BAZZA WELL	06/30/87		6.4	0.01 <	550	16	0.018	6.93
BAZZA PIT	09/27/88		6.8	0.01 <	673	0.29	0.073	7.36
BAZZA PIT	06/28/88		2.6	0.01 <	505	2	0.01 <	7.67
BAZZA PIT	04/25/88		1 <	0.01 <	513	3.3	0.01 <	7.9
BAZZA PIT	06/30/87		11	0.01 <	769	2.7	0.05	8.24
BAZZA PIT	04/16/87		1 <	0.01 <	544	0.48	0.02	8.26
BAZZA WELL	07/14/89	0.1 <	5 <	0.005 <	540	3.2	0.005 <	7.5
BAZZA WELL	04/06/89	0.1 <	5 <	0.005 <	600	6.4	0.009	7
BAZZA WELL	01/12/89	0.1 <	5 <	0.005 <	580	8	0.005 <	7.1
BAZZA WELL	01/12/89	0.1 <	5 <	0.005 <	580	8	0.005 <	7.1
BAZZA WELL	11/10/88	0.1 <	6	0.005 <	590	8	0.029	7.6
BW-1	11/30/88	0.1 <	5 <	0.005 <	650	2.2	0.005 <	7.2
BW-1	11/21/88	0.1 <	14	0.005 <	600	10	0.005 <	7
BW-1	11/10/88	0.1 <	5 <	0.005 <	580	2	0.005 <	6.7
BW-1	11/02/88		5 <	0.005 <	630	0.5	0.032	6.8
BW-1	10/05/88	0.1 <	210	0.005 <	1000	1.8	0.005 <	7.3
BWD-1	06/25/87		12	0.018	528	9.6	0.015	8.23
GWOP-6	03/10/89							
GWOP-6	03/06/89							
GWOP-6	02/24/89	0.2	160	0.005 <	560	90	0.064	7.8
GWOP 6	06/29/88		281	0.01 <	687	140	0.135	7.39
GWOP 6	06/09/88							
GWOP 6	06/09/88							7.37
GWOP 6	04/26/88							7.67
GWOP 6	03/02/88							7.53

Well ID	Sampling Date	Settleable Solids	Suspended Solids	Thallium	Total Dissolved Solids	Turbidity	Zinc (T)	pH Units
GWOF 6	01/28/88		2710	0.01 <	254	550	1.18	7.58
GWOF-10	09/29/89							7.4
GWOF-10	08/17/89							7.5
GWOF-10	07/19/89	0.1 <	5 <	0.005 <	360	0.2	0.005 <	7.8
GWOF-10	06/29/89	0.1 <	5 <	0.005 <	370	0.3	0.005 <	7.6
GWOF-10	05/17/89							7.7
GWOF-10	04/12/89	0.1 <	5 <	0.005 <	310	0.3	0.006	7.6
GWOF-10	03/22/89							7.6
GWOF-10	02/28/89							7.9
GWOF-10	01/27/89	0.03	5 <	0.005 <	390	7	0.022	8.2
GWOF-10	12/21/88							9.5
GWOF-10	11/22/88	5	4200	0.005 <	420	500	0.13	9.8
GWOF-11	09/29/89							7.9
GWOF-11	08/17/89							8.2
GWOF-11	07/25/89	0.1 <	5 <	0.005 <	340	0.42	0.005 <	8.3
GWOF-11	06/29/89	0.1 <	5 <	0.005 <	380	0.35	0.005 <	8
GWOF-11	05/17/89							6.5
GWOF-11	04/12/89	0.1	12	0.005 <	350	0.65	0.006	8.1
GWOF-11	03/22/89							8
GWOF-11	02/28/89							8.1
GWOF-11	02/28/89							8.1
GWOF-11	01/27/89	2.5	1400	0.005 <	360	160	0.04	9.5
GWOF-11	12/21/88							8.5
GWOF-11	11/22/88	1.5	670	0.005 <	380	150	0.036	9
GWOF-2	08/31/89							8.1
GWOF-2	07/14/89	0.2	100	0.005 <	590	66	0.035	8.6
GWOF-2	06/30/89							8.6
GWOF-2	05/23/89							8.7
GWOF-2	04/28/89	0.3	62	0.005 <	700	23	0.005 <	8.6
GWOF-2	03/24/89							8.4
GWOF-2	02/28/89							7.9
GWOF-2	09/08/88							
GWOF-4	08/31/89							7.5
GWOF-4	07/14/89	0.2	49	0.005 <	350	46	0.038	7.5
GWOF-4	06/30/89							7.4
GWOF-4	05/23/89	2	850	0.005 <	370	75	0.25	7.5
GWOF-4	02/28/89	0.5	92	0.005 <	430	43	0.029	7.7
GWOF-4	12/21/88							7.6
GWOF-4	11/21/88	1.9	1400	0.005 <	320	310	0.18	7.7
GWOF-4	10/21/88							7.6
GWOF-4	09/28/88		4230	0.01 <	383		0.453	7.31
GWOF-4	09/08/88							
GWOF-4	07/28/88							7.48
GWOF-4	06/29/88		3380	0.01 <	303	390	0.175	7.54
GWOF-4	06/09/88							7.51
GWOF-4	06/09/88							7.54
GWOF-4	04/26/88							7.65

Well ID	Sampling Date	Settleable Solids	Suspended Solids	Thallium	Total Dissolved Solids	Turbidity	Zinc (T)	pH Units
GWOF-4	03/02/88							7.86
GWOF-5	03/23/88							7.75
PANCANA	03/02/88		5.6	0.01 <	528	1.6	0.045	8.07
PANCANA	07/22/86				564		0.204	7.95
PPO #3	11/30/88	0.2	17	0.005 <	520	30	0.042	7.3
PPW #1	01/04/89	0.4	32	0.005 <	440	8.5	0.058	7.7
PPW #2	05/23/89	0.1 <	5 <	0.005 <	430	0.7	0.024	7.4
PPW #3	11/30/88	0.2	17	0.01 <	520	30	0.042	7.3
PPW #5	09/11/89	0.1 <	5 <	0.005 <	460	1.2	0.029	7.2
PPW #6	10/09/89	0.1 <	5 <	0.005 <	620	0.4	0.009	8
PPW-6A	07/20/89	0.1 <	6	0.005 <	500	8.5	0.005 <	7.8
PUPW-2	03/24/88		1.2	0.01 <	394	0.32	0.01	7.38
PUPW-2	03/16/88		2.4	0.01 <	463	5	0.01 <	7.88
PUPW-2	03/09/88		4	0.01 <	460	7.2	0.045	7.44
PUPW-2	03/02/88		7.2	0.01 <	470	6.8	0.023	7.74
PUPW-2	02/25/88		16	0.01 <	561	20	0.233	7.57
PUPW-2	02/18/88		2.8	0.01 <	490	7.3	0.105	7.7
PUPW-2	02/11/88		1.9	0.01 <	442	8.9	0.048	7.57
P-181	03/24/88		1.2	0.01 <	488	6.9	0.013	7.44
P-181	03/16/88		4.8	0.01 <	362	0.41	0.01 <	7.47
P-181	03/09/88		2.4	0.01 <	346	0.72	0.518	7.42
P-181	03/02/88		1 <	0.01 <	362	0.44	0.44	7.81
P-181	09/11/87		1 <	0.01 <	339	2	0.03	7.6
P-181	09/10/87		1 <	0.01 <	344	1	0.06	7.7
P-181	09/08/87		2	0.01 <	319	2.8	0.03	8.15
P-181	09/04/87		1.6	0.01 <	359	2.3	0.045	8.18
RC-4	12/21/88							8.4
W BAZZA PIT	07/14/89	0.1 <	5 <	0.005 <	580	3.4	0.005 <	7.7
W BAZZA PIT	04/26/89	0.1 <	6	0.005 <	540	1.5	0.006	7.7
W BAZZA PIT	01/05/89	0.1 <	16	0.005 <	610	4	0.01	7.2
W BAZZA PIT	11/10/88	0.1 <	24	0.005 <	560	4	0.022	7.6
W BAZZA PIT	04/16/87		1 <	0.01 <	504	0.77	0.01 <	7.79
W #9 PIT	07/14/89	0.1 <	5 <	0.005 <	480	4	0.005 <	8
W #9 PIT	04/06/89	0.1 <	5 <	0.005 <	500	0.8	0.005	8
W #9 PIT	01/05/89	0.1 <	39	0.005 <	560	20	0.005 <	7.7
W #9 PIT	11/10/88	0.1 <	8	0.005 <	570	2.5	0.02	7.8
W #9 PIT	09/27/88		66	0.01 <	584	3.8	0.285	7.52
W #9 PIT	06/28/88		12	0.01 <	450	7.6	0.05	7.99
W #9 PIT	04/25/88		1 <	0.01 <	433	0.95	0.01 <	8.4
W #9 PIT	02/18/88		11	0.01 <	326	3.3	0.057	8.3
W #9 PIT	06/30/87		26	0.01 <	456	9.3	0.01 <	8.4
W #9 PIT	04/16/87		1 <	0.01 <	457	0.82	0.045	8.07
WW1	11/10/88	0.1 <	5 <	0.005 <	540	0.2 <	0.032	7.7
WW1	09/27/88		9.2	0.01 <	520	17.5	0.383	7.76
WW1	06/30/88		4.2	0.01 <	585	2.1	0.01 <	7.72
WW1	04/26/88							8.08
WW1	10/26/87							7.78

Well ID	Sampling Date	Settleable Solids	Suspended Solids	Thallium	Total Dissolved Solids	Turbidity	Zinc (T)	pH Units
WW1	06/30/87		2.4	0.01 <	503	0.[illegible]	0.023	8.08
WW1	06/11/87							
WW1	04/16/87		1 <	0.01 <	534	0.66	0.06	8

Well ID	Sampling Date	Cations	Anions
AA WELL	07/14/89		
AA WELL	04/06/89		
AA WELL	01/12/89		
AA WELL	11/21/88		
AA WELL	09/27/88	2.71	2.85
AA WELL	06/29/88	4.47	4.2
AA WELL	04/26/88	3.46	3.78
AA WELL	01/28/88	4.51	4.37
AA WELL	12/29/87		
AA WELL	12/29/87		
AA WELL	10/28/87		
AA WELL	10/28/87		
AA WELL	09/17/87	4.51	4.44
AA WELL	08/06/87	3.01	3.42
AA WELL	06/30/87	4.35	4.32
AA WELL	06/15/87	4.97	4.73
AA WELL	09/24/87	5.99	5.82
BAZZA WELL	11/10/88		
BAZZA WELL	09/27/88	12.15	11.75
BAZZA WELL	06/29/88	10.68	11.07
BAZZA WELL	04/25/88	10.44	10.53
BAZZA WELL	02/25/88	6.86	7.28
BAZZA WELL	06/30/87	10.46	10.96
BAZZA PIT	09/27/88	11.61	11.89
BAZZA PIT	06/28/88	9.61	9.91
BAZZA PIT	04/25/88	10.33	9.73
BAZZA PIT	06/30/87	12.04	12.35
BAZZA PIT	04/16/87	9.5	9.56
BAZZA WELL	07/14/89		
BAZZA WELL	04/06/89		
BAZZA WELL	01/12/89		
BAZZA WELL	01/12/89		
BAZZA WELL	11/10/88		
BW-1	11/30/88		
BW-1	11/21/88		
BW-1	11/10/88		
BW-1	11/02/88		
BW-1	10/05/88		
BWD-1	06/25/87	10.33	10.68
GWOP-6	03/10/89		
GWOP-6	03/06/89		
GWOP-6	02/24/89		
GWOP 6	06/29/88	9.38	9.1
GWOP 6	06/09/88		
GWOP 6	06/09/88		
GWOP 6	04/26/88		
GWOP 6	03/02/88		

Well ID	Sampling Date	Cations	Anions
GWOF 6	01/28/88	4.07	4.19
GWOF-10	09/29/89		
GWOF-10	08/17/89		
GWOF-10	07/19/89		
GWOF-10	06/29/89		
GWOF-10	05/17/89		
GWOF-10	04/12/89		
GWOF-10	03/22/89		
GWOF-10	02/28/89		
GWOF-10	01/27/89		
GWOF-10	12/21/88		
GWOF-10	11/22/88		
GWOF-11	09/29/89		
GWOF-11	08/17/89		
GWOF-11	07/25/89		
GWOF-11	06/29/89		
GWOF-11	05/17/89		
GWOF-11	04/12/89		
GWOF-11	03/22/89		
GWOF-11	02/28/89		
GWOF-11	02/28/89		
GWOF-11	01/27/89		
GWOF-11	12/21/88		
GWOF-11	11/22/88		
GWOF-2	08/31/89		
GWOF-2	07/14/89		
GWOF-2	06/30/89		
GWOF-2	05/23/89		
GWOF-2	04/28/89		
GWOF-2	03/24/89		
GWOF-2	02/28/89		
GWOF-2	09/08/88		
GWOF-4	08/31/89		
GWOF-4	07/14/89		
GWOF-4	06/30/89		
GWOF-4	05/23/89		
GWOF-4	02/28/89		
GWOF-4	12/21/88		
GWOF-4	11/21/88		
GWOF-4	10/21/88		
GWOF-4	09/28/88	4.7	5.09
GWOF-4	09/08/88		
GWOF-4	07/28/88		
GWOF-4	06/29/88	4.98	5.13
GWOF-4	06/09/88		
GWOF-4	06/09/88		
GWOF-4	04/26/88		

Well ID	Sampling Date	Cations	Anions
GWOP-4	03/02/88		
GWOP-5	03/23/88		
FANCANA	03/02/88	8.21	7.79
FANCANA	07/22/86		
FPO #3	11/30/88		
FPW #1	01/04/89		
FPW #2	05/23/89		
FPW #3	11/30/88		
FPW #5	09/11/89		
FPW #6	10/09/89		
FPW-6A	07/20/89		
FUFW-2	03/24/88	6.98	6.25
FUFW-2	03/16/88	7	7.05
FUFW-2	03/09/88	7.03	7.42
FUFW-2	03/02/88	7.16	7.18
FUFW-2	02/25/88	9.82	10.07
FUFW-2	02/18/88	6.91	7.04
FUFW-2	02/11/88	6.01	6.53
F-181	03/24/88	7.41	7.29
F-181	03/16/88	5.67	6.08
F-181	03/09/88	5.32	5.6
F-181	03/02/88	4.72	5.13
F-181	09/11/87	4.53	4.65
F-181	09/10/87	4.56	4.61
F-181	09/08/87	3.85	4.06
F-181	09/04/87	4.09	4.19
FC-4	12/21/88		
W BAZZA PIT	07/14/89		
W BAZZA PIT	04/26/89		
W BAZZA PIT	01/05/89		
W BAZZA PIT	11/10/88		
W BAZZA PIT	04/16/87	9.95	10.55
W #9 PIT	07/14/89		
W #9 PIT	04/06/89		
W #9 PIT	01/05/89		
W #9 PIT	11/10/88		
W #9 PIT	09/27/88	11.23	10.94
W #9 PIT	06/28/88	7.5	7.97
W #9 PIT	04/25/88	8	7.25
W #9 PIT	02/18/88	5.34	5.48
W #9 PIT	06/30/87	8.14	7.9
W #9 PIT	04/16/87	8.89	8.52
WW1	11/10/88		
WW1	09/27/88	6.96	6.91
WW1	06/30/88	8.16	7.53
WW1	04/26/88		
WW1	10/26/87		

Well ID	Sampling Date	Cations	Anions
WW1	06/30/87	7.87	7.84
WW1	06/11/87		
WW1	04/16/87	8.38	8.14

D-3 - Treatment Plant Database

BARRICK GOLD STRIKE - TREATMENT PLANT DATA BASE
ENSR PROJECT NUMBER: 0739-001-203
FILE NAME: TREAT-DB.WK1

INPUT RANGE

Well ID	Sampling Date	Alkalinity	Aluminum (T)	Ammonia	Arsenic (T) a	Barium (T)	Bicarbonate	Boron (T)	Cadmium (T)
FLUME ABOVE DAM	05/09/90	250		0.3	0.029	0.13	300	0.8 <	0.005
FLUME ABOVE DAM	05/17/90	330		0.7	0.021	0.15	400	0.7 <	0.005
FLUME ABOVE DAM	05/21/90	330		0.7	0.026	0.15	400	0.7 <	0.005
FLUME ABOVE DAM	05/23/90	260	<	0.2	0.014	0.16	320	0.7 <	0.005
FLUME ABOVE DAM	05/31/90	280	<	0.2	0.035	0.14	340	0.9 <	0.005
FLUME ABOVE DAM	06/06/90	250		0.2	0.007	0.08	300	0.7 <	0.005
FLUME ABOVE DAM	06/13/90	260		1.2	0.019	0.11	320	0.8 <	0.005
FLUME ABOVE DAM	06/20/90	250		1	0.011	0.12	310	0.8 <	0.005
FLUME ABOVE DAM	06/26/90	240	<	0.2	0.042	0.09	270	0.7 <	0.005
FLUME ABOVE DAM	07/02/90	260		0.3	0.011	0.1	310	0.8 <	0.005
FLUME ABOVE DAM	07/11/90	260	<	0.2	0.01	0.12	310	0.8 <	0.005
FLUME ABOVE DAM	07/20/90	270		0.9	0.027	0.15	330	0.8 <	0.005
FLUME ABOVE DAM	07/26/90	290		0.6	0.02	0.13	350	0.8 <	0.005
FLUME ABOVE DAM	08/01/90	300		0.7	0.022	0.1	360	0.8 <	0.005
FLUME ABOVE DAM	08/08/90	290		1	0.029	0.13	260	0.8 <	0.005
FLUME ABOVE DAM	08/15/90	290	<	0.2	0.041	0.11	350	0.7 <	0.005
DISCHARGE POINT	05/09/90	310		0.5	0.034	0.08	370	0.8 <	0.005
DISCHARGE POINT	05/17/90	260		1.1	0.036	0.23	320	0.8 <	0.005
DISCHARGE POINT	05/23/90	330	<	0.2	0.024	0.14	400	0.7 <	0.005
DISCHARGE POINT	05/31/90	340	<	0.2	0.06	0.14	410	0.9 <	0.005
DISCHARGE POINT	06/06/90	340		0.2	0.028	0.13	420	0.7 <	0.005
DISCHARGE POINT	06/13/90	350		2.2	0.02	0.13	420	0.7 <	0.005
DISCHARGE POINT	06/20/90	360		1.6	0.022	0.11	440	0.7 <	0.005
DISCHARGE POINT	06/26/90	290		0.2	0.04	0.13	360	0.7 <	0.005
DISCHARGE POINT	07/02/90	310		0.7 <	0.005	0.1	410	0.8 <	0.005
DISCHARGE POINT	07/11/90	310		0.5	0.011	0.16	380	0.8 <	0.005
DISCHARGE POINT	07/20/90	390		1.4	0.044	0.13	470	0.8 <	0.005
DISCHARGE POINT	07/26/90	370		1.2	0.027	0.13	450	0.7 <	0.005
DISCHARGE POINT	08/01/90	400		1.1	0.025	0.12	480	0.7 <	0.005
DISCHARGE POINT	08/08/90	370		1.3	0.043	0.13	440	0.9 <	0.005
DISCHARGE POINT	08/15/90	380		0.2	0.057	0.11	460	0.7 <	0.005

End of Database

Well ID	Sampling Date	Calcium	Carbonate	Chloride	Chromium (Hex)	Chromium (T)	Conductivity	Copper (T)	Cyanide (T)
FLUME ABOVE DAM	05/09/90	67 <	5	25	<	0.005	770 <	0.005 <	0.005
FLUME ABOVE DAM	05/17/90	85 <	5	21	<	0.005	960 <	0.005 <	0.005
FLUME ABOVE DAM	05/21/90	85 <	5	21	<	0.005	960 <	0.005 <	0.005
FLUME ABOVE DAM	05/23/90	64 <	5	19	<	0.005	600 <	0.005 <	0.005
FLUME ABOVE DAM	05/31/90	69 <	5	23	<	0.005	1000 <	0.005 <	0.005
FLUME ABOVE DAM	06/06/90	65 <	5	19	<	0.005	790 <	0.005 <	0.005
FLUME ABOVE DAM	06/13/90	49 <	5	17	<	0.005	840 <	0.005 <	0.005
FLUME ABOVE DAM	06/20/90	59 <	5	18	<	0.005	890 <	0.005 <	0.005
FLUME ABOVE DAM	06/26/90	26	6	19	<	0.005	890 <	0.005 <	0.005
FLUME ABOVE DAM	07/02/90	38 <	5	18	<	0.005	750 <	0.005 <	0.005
FLUME ABOVE DAM	07/11/90	46 <	5	17	<	0.005	860 <	0.005 <	0.005
FLUME ABOVE DAM	07/20/90	54 <	5	18	<	0.005	570	0.007 <	0.005
FLUME ABOVE DAM	07/26/90	56 <	5	15	<	0.005	570 <	0.005 <	0.005
FLUME ABOVE DAM	08/01/90	47 <	5	18	<	0.005	670 <	0.005 <	0.005
FLUME ABOVE DAM	08/08/90	57 <	5	18	<	0.005	960 <	0.005 <	0.005
FLUME ABOVE DAM	08/15/90	52 <	5	19		0.005	920 <	0.005 <	0.005
DISCHARGE POINT	05/09/90	80 <	5	24	<	0.005	830 <	0.005 <	0.005
DISCHARGE POINT	05/17/90	70 <	5	20	<	0.005	880	0.01 <	0.005
DISCHARGE POINT	05/23/90	95 <	5	19	<	0.005	680 <	0.005 <	0.005
DISCHARGE POINT	05/31/90	86 <	5	22	<	0.005	710 <	0.005 <	0.005
DISCHARGE POINT	06/06/90	92 <	5	20	<	0.005	930 <	0.005 <	0.005
DISCHIRGE POINT	06/13/90	73 <	5	17		0.006	1000	0.008 <	0.005
DISCHARGE POINT	06/20/90	84 <	5	18		0.006	1100 <	0.005 <	0.005
DISCHARGE POINT	06/26/90	75 <	5	19	<	0.005	970 <	0.005 <	0.005
DISCHARGE POINT	07/02/90	70 <	5	16	<	0.005	880 <	0.005 <	0.005
DISCHARGE POINT	07/11/90	16 <	5	16	<	0.005	920 <	0.005 <	0.005
DISCHARGE POINT	07/20/90	79 <	5	17	<	0.005	670 <	0.005 <	0.005
DISCHARGE POINT	07/26/90	86 <	5	15	<	0.005	720 <	0.005 <	0.005
DISCHARGE POINT	08/01/90	80 <	5	18	<	0.005	930 <	0.005 <	0.005
DISCHARGE POINT	08/08/90	80 <	5	17	<	0.005	1000 <	0.005 <	0.005
DISCHARGE POINT	08/15/90	76 <	5	19		0.005	1000	0.005 <	0.005

End of Database

Well ID	Sampling Date	Cyanide (Free)	Cyanide (WAD)	Fluoride	Gold	Hardness	Hardness (Non-Carb)	Hardness (T)	Hydroxide
FLUME ABOVE DAM	05/09/90			0.9				< 5	
FLUME ABOVE DAM	05/17/90			1.1				< 5	
FLUME ABOVE DAM	05/21/90			1.1				< 5	
FLUME ABOVE DAM	05/23/90			1.2				< 5	
FLUME ABOVE DAM	05/31/90			1.1				< 5	
FLUME ABOVE DAM	06/06/90			1.2				< 5	<
FLUME ABOVE DAM	06/13/90			1.2				< 5	
FLUME ABOVE DAM	06/20/90			1.3				< 5	
FLUME ABOVE DAM	06/26/90			1				< 5	
FLUME ABOVE DAM	07/02/90			1.1				< 5	
FLUME ABOVE DAM	07/11/90			1.2					
FLUME ABOVE DAM	07/20/90			0.6					
FLUME ABOVE DAM	07/26/90			0.6					
FLUME ABOVE DAM	08/01/90			1.3				< 5	
FLUME ABOVE DAM	08/08/90			1.4					
FLUME ABOVE DAM	08/15/90			1.2				< 5	
DISCHARGE POINT	05/09/90			0.9				< 5	
DISCHARGE POINT	05/17/90			1.1				< 5	
DISCHARGE POINT	05/23/90			1.3				< 5	
DISCHARGE POINT	05/31/90			1.1				< 5	
DISCHARGE POINT	06/06/90			1.2				< 5	
DISCHARGE POINT	06/13/90			1.3				< 5	
DISCHARGE POINT	06/20/90			1.3				< 5	
DISCHARGE POINT	06/26/90			1.1				< 5	
DISCHARGE POINT	07/02/90			1.2				< 5	
DISCHARGE POINT	07/11/90			1.3					
DISCHARGE POINT	07/20/90			0.7					
DISCHARGE POINT	07/26/90			0.7					
DISCHARGE POINT	08/01/90			1.3				< 5	
DISCHARGE POINT	08/08/90			1.4					
DISCHARGE POINT	08/15/90			1.2					

End of Database

Well ID	Sampling Date	Iron (D)	Iron (T)	Lead (T)	Magnesium	Manganese (T)	Mercury	Nickel (T)	Nitrite
FLUME ABOVE DAM	05/09/90		2.4 <	0.005	25	0.071 <	0.0001		3.1
FLUME ABOVE DAM	05/17/90		0.94 <	0.005	25	0.02	0.0001		1.3
FLUME ABOVE DAM	05/21/90		0.94 <	0.005	25	0.02	0.0001		1.3
FLUME ABOVE DAM	05/23/90		2.7 <	0.005	25	0.074 <	0.0001		2
FLUME ABOVE DAM	05/31/90	0.01	0.86 <	0.005	24	0.043 <	0.0001		2.2
FLUME ABOVE DAM	06/06/90	0.01	0.32 <	0.005	24	0.016 <	0.0001		1.7
FLUME ABOVE DAM	06/13/90		0.44 <	0.005	24	0.015 <	0.0001		0.92
FLUME ABOVE DAM	06/20/90		0.97 <	0.005	25	0.046 <	0.0001		1.1
FLUME ABOVE DAM	06/26/90		0.07 <	0.005	22	0.005 <	0.0001		1.1
FLUME ABOVE DAM	07/02/90		0.61 <	0.005	24	0.027 <	0.0001		0.78
FLUME ABOVE DAM	07/11/90		0.59 <	0.005	23	0.024 <	0.0001		0.57
FLUME ABOVE DAM	07/20/90		1.7 <	0.005	23	0.06 <	0.0001		0.08
FLUME ABOVE DAM	07/26/90		0.93 <	0.005	23	0.04 <	0.0001		0.44
FLUME ABOVE DAM	08/01/90		0.32 <	0.005	23	0.01 <	0.0001		0.61
FLUME ABOVE DAM	08/08/90		0.46 <	0.005	26	0.027 <	0.0001		1.1
FLUME ABOVE DAM	08/15/90		0.58 <	0.005	23	0.024 <	0.0001		0.8
DISCHARGE POINT	05/09/90		1.7 <	0.005	24	0.041 <	0.0001		2.5
DISCHARGE POINT	05/17/90		5.1 <	0.005	26	0.15	0.0003		1.4
DISCHARGE POINT	05/23/90		1.3 <	0.005	26	0.022 <	0.0001		1.8
DISCHARGE POINT	05/31/90		0.97 <	0.005	24	0.038 <	0.0001		2.3
DISCHARGE POINT	06/06/90		1.4 <	0.005	27	0.035 <	0.0001		1.7
DISCHARGE POINT	06/13/90		0.55 <	0.005	23	0.17 <	0.0001		0.79
DISCHARGE POINT	06/20/90		0.39 <	0.005	25	0.22	0.0001		0.73
DISCHARGE POINT	06/26/90		0.49 <	0.005	24	0.007 <	0.0001		1.2
DISCHARGE POINT	07/02/90		0.02 <	0.005	24	0.009 <	0.0001		0.66
DISCHARGE POINT	07/11/90		0.79 <	0.005	24	0.015 <	0.0001		0.32
DISCHARGE POINT	07/20/90		0.71 <	0.005	23	0.022 <	0.0001		1.1
DISCHARGE POINT	07/26/90		0.86 <	0.005	23	0.031 <	0.0001		0.39
DISCHARGE POINT	08/01/90		0.87 <	0.005	22	0.024 <	0.0001		0.39
DISCHARGE POINT	08/08/90		0.88 <	0.005	26	0.02 <	0.0001		1.1
DISCHARGE POINT	08/15/90		0.4 <	0.005	23	0.022	0.0001		1

End of Database

Well ID	Sampling Date	Phosphate (Ortho)	Potassium	Selenium (T)	Silica (D)	Silica (T-ICP)	Silver (T)	Sodium	Sulfate
FLUME ABOVE DAM	05/09/90		20	0.006		<	0.005	80	110
FLUME ABOVE DAM	05/17/90		22 <	0.005		<	0.005	84	75
FLUME ABOVE DAM	05/21/90		22 <	0.005		<	0.005	84	75
FLUME ABOVE DAM	05/23/90		25 <	0.005		<	0.005	84	75
FLUME ABOVE DAM	05/31/90		23 <	0.005		<	0.005	76	86
FLUME ABOVE DAM	06/06/90		25 <	0.005		<	0.005	59	110
FLUME ABOVE DAM	06/13/90		27 <	0.005		<	0.005	88	56
FLUME ABOVE DAM	06/20/90		25 <	0.005		<	0.005	82	84
FLUME ABOVE DAM	06/26/90		21 <	0.005		<	0.005	78	80
FLUME ABOVE DAM	07/02/90		23 <	0.005		<	0.005	77	72
FLUME ABOVE DAM	07/11/90		19 <	0.005		<	0.005	69	74
FLUME ABOVE DAM	07/20/90		24 <	0.005		<	0.005	83	76
FLUME ABOVE DAM	07/26/90		23 <	0.005		<	0.005	77	69
FLUME ABOVE DAM	08/01/90		23 <	0.005		<	0.005	81	79
FLUME ABOVE DAM	08/08/90		20 <	0.005		<	0.005	72	81
FLUME ABOVE DAM	08/15/90		23 <	0.005		<	0.005	71	75
DISCHARGE POINT	05/09/90		20	0.007		<	0.005	81	110
DISCHARGE POINT	05/17/90		25 <	0.005		<	0.005	72	72
DISCHARGE POINT	05/23/90		21 <	0.005		<	0.005	80	92
DISCHARGE POINT	05/31/90		23 <	0.005		<	0.005	79	86
DISCHARGE POINT	06/06/90		25	0.005		<	0.005	81	94
DISCHARGE POINT	06/13/90		17	0.006		<	0.005	64	57
DISCHARGE POINT	06/20/90		23 <	0.005		<	0.005	77	89
DISCHARGE POINT	06/26/90		21 <	0.005		<	0.005	73	93
DISCHARGE POINT	07/02/90		23 <	0.005		<	0.005	77	55
DISCHARGE POINT	07/11/90		19 <	0.005		<	0.005	72	60
DISCHARGE POINT	07/20/90		24 <	0.005		<	0.005	83	65
DISCHARGE POINT	07/26/90		22 <	0.005		<	0.005	70	74
DISCHARGE POINT	08/01/90		20 <	0.005		<	0.005	73	72
DISCHARGE POINT	08/08/90		20 <	0.005		<	0.005	70	65
DISCHARGE POINT	08/15/90		23 <	0.005		<	0.005	71	53

End of Database

Well ID	Sampling Date	Settleable Solids	Suspended Solids	Thallium	Total Dissolved Solids	Turbidity	Zinc (T)	pH Units
FLUME ABOVE DAM	05/09/90		100		14		0.023	7.9
FLUME ABOVE DAM	05/17/90		23		9.1		0.028	8
FLUME ABOVE DAM	05/21/90		23		9.1		0.028	8
FLUME ABOVE DAM	05/23/90		48		2		0.011	7.7
FLUME ABOVE DAM	05/31/90		62		1.5	<	0.005	8
FLUME ABOVE DAM	06/06/90		16		1	<	0.005	7.9
FLUME ABOVE DAM	06/13/90		38		1.3		0.011	8.1
FLUME ABOVE DAM	06/20/90		86		7		0.013	7.7
FLUME ABOVE DAM	06/26/90		6		4.2		0.008	8.5
FLUME ABOVE DAM	07/02/90		37		6.8		0.008	8.2
FLUME ABOVE DAM	07/11/90		63		5		0.011	8.2
FLUME ABOVE DAM	07/20/90		94		1.9	<	0.005	7.7
FLUME ABOVE DAM	07/26/90		53		4.9		0.006	7.9
FLUME ABOVE DAM	08/01/90	<	5		0.5		0.027	7.9
FLUME ABOVE DAM	08/08/90		46		1.8		0.013	8
FLUME ABOVE DAM	08/15/90		46		4.2		0.005	8
DISCHARGE POINT	05/09/90		5		6.5		0.041	7.6
DISCHARGE POINT	05/17/90		250		40		0.022	8
DISCHARGE POINT	05/23/90		13		1.6		0.036	7.4
DISCHARGE POINT	05/31/90	<	5		4.9		0.024	8
DISCHARGE POINT	06/06/90		15		8		0.013	7.8
DISCHARGE POINT	06/13/90		14		1.3		0.02	7.7
DISCHARGE POINT	06/20/90		10		2.4		0.016	7.8
DISCHARGE POINT	06/26/90		8		1.4		0.023	7.8
DISCHARGE POINT	07/02/90		20		5.8		0.012	7.7
DISCHARGE POINT	07/11/90		10		2.7		0.041	7.8
DISCHARGE POINT	07/20/90		8		1.1	<	0.005	7.7
DISCHARGE POINT	07/26/90		16		2.6		0.018	7.6
DISCHARGE POINT	08/01/90		6		1	<	0.005	7.7
DISCHARGE POINT	08/08/90		12		1.1		0.016	7.9
DISCHARGE POINT	08/15/90		16		3.1	<	0.005	7.7

End of Database

Well ID	Sampling Date	Cations	Anions	Index 1
FLUME ABOVE DAM	05/09/90			
FLUME ABOVE DAM	05/17/90			
FLUME ABOVE DAM	05/21/90			
FLUME ABOVE DAM	05/23/90			
FLUME ABOVE DAM	05/31/90			
FLUME ABOVE DAM	06/06/90			
FLUME ABOVE DAM	06/13/90			
FLUME ABOVE DAM	06/20/90			
FLUME ABOVE DAM	06/26/90			
FLUME ABOVE DAM	07/02/90			
FLUME ABOVE DAM	07/11/90			
FLUME ABOVE DAM	07/20/90			
FLUME ABOVE DAM	07/26/90			
FLUME ABOVE DAM	08/01/90			
FLUME ABOVE DAM	08/08/90			
FLUME ABOVE DAM	08/15/90			
DISCHARGE POINT	05/09/90			
DISCHARGE POINT	05/17/90			
DISCHARGE POINT	05/23/90			
DISCHARGE POINT	05/31/90			
DISCHARGE POINT	06/06/90			
DISCHARGE POINT	06/13/90			
DISCHARGE POINT	06/20/90			
DISCHARGE POINT	06/26/90			
DISCHARGE POINT	07/02/90			
DISCHARGE POINT	07/11/90			
DISCHARGE POINT	07/20/90			
DISCHARGE POINT	07/26/90			
DISCHARGE POINT	08/01/90			
DISCHARGE POINT	08/08/90			
DISCHARGE POINT	08/15/90			

End of Database

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